

APRIL 1979

Petersen's Photographic Magazine

\$1.50
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AT HOME WITH E-6

STEP-BY-STEP

PUDDLE PUNS

HAVE FUN AFTER
THE RAINS

HOW TO LIVE WITH AUTOMATION

WHAT IT CAN AND
CAN'T DO FOR YOU

PLUS:

GREG ROBINSON
RETROSPECTIVE PORTFOLIO



FEELING LUCKY?

ENTER OUR SUPER
SWEEPSTAKES





Abstract photography Confidence



Have you never dreamed of turning the world on end... of giving depth and dimension to your visions... of transforming a common scene into an uncommon image of dazzling colors and shapes?

If you want to pursue your creative ideas to the limits of your imagination, consider this: One camera is unequalled as the choice of serious photographers, including the overwhelming majority of professionals. The Nikon F2A, unique in its consistently reliable performance and matchless versatility.

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The supremely reliable, center-weighted Nikon F2A meter/finder system is interchangeable with any of five others. Even automatic exposure control is available for use with the F2AS Photomic meter/finder. The ultimate test of photographic creativity is, of course, the image itself. Nearly sixty Nikkor lenses, from 6mm Fisheye to 2000mm super telephoto, give you superlative sharpness, uniform lens-to-lens color consistency, and sheer optical variety without equal.

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with the of Nikon



We'll stop making razor blades
when we can't keep
making them better.

King C. Gillette



Gillette announces new Microsmooth® blades.

A major improvement for Gillette twin-blade shaving

King C. Gillette promised to keep improving your shave. That's why he would have been more than pleased with our new Microsmooth twin blades.

Microsmooth is a patented new honing process that produces the smoothest Gillette razor-blade edges now possible.

It's the result of a technological breakthrough that uses ultrasonic energy to smooth the blade edge after it's sharpened and honed by conventional methods. And what it means to you is a smooth, safe, comfortable twin-blade shave.

For Gillette TRAC II users Microsmooth blades mean a smoother shave. And for ATRA users Microsmooth blades plus the pivoting head give you Gillette's best shave.

But just because new Microsmooth twin blades give outstanding shaves, don't think we've stopped trying to make them better.

After all, we've got a promise to keep.



Try new Gillette Microsmooth twin blades.



Selected by the U.S. Olympic Committee.

this month

FEATURES

Blueprint	27
How to make a fisheye adapter—by Aldo Panzieri	
All About Automation	33
Electronics demystified—by Peggy Sealfon	
Processing E-6 at Home	44
Soup up a batch of Ektachrome—the proof's in the pudding—by Bill Hurter	
Talking Tech	54
Photos into print—by David Brooks	
Gregory Alan Robinson: A Retrospective Portfolio	56
Tribute to a photojournalist	
Puddle Photography	70
Reflections on visual puns—by Julius Vitali	
Storyboarding	76
Picture the action before you shoot—by Markene Kruse-Smith	
The Yob System, Part III	81
Making and evaluating your first Y-O-B negatives—by Parry C. Yob	
Spec Sheet	92
Sankyo ES-44XL VAF Auto-Focus super 8 movie camera	

DEPARTMENTS

On the Scene	4	In Sight	22
Renaissance		Have You Got Style?	
Guide Lines	9	Other Voices	23
Those Hard-Water Blues		Silver Dreams	26
Far East Journal	10	Printer's Devil	
Sigma: The Sum Total		Product Proof Sheet	69
Focus on Filmmaking	12	Advertising Index	96
Getting into Motion		Club Close-Ups	97
Self-Assignment	14	A Club with a Sense of History	
The "Kazinsky" Tent		Vintage Viewfinder	98
Tools of the Trade	16	Are Innovative Cameras Worth Collecting?	
Light and Color Temperature		Gallery '79	100
Electronically Yours	18	Short Exposures	104
A Modern Miracle in Miniature		One to One	106
Where the Action Is	19	Follow the Leader	
Book Contracts			
Camera on Campus	20		
Midyear Resolutions			

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PAGE 44



PAGE 56



PAGE 70



PAGE 76



PAGE 97



PAGE 100



ON THE SCENE

the EDITORS

RENAISSANCE



SEALFON



HURTER



VITALI



PANZIERI



KRUSE-SMITH



YOB



ROBINSON

Ah, April—the month when spring has fully arrived and left winter far behind. The world is burgeoning with new life, and it is a time of new beginnings, of reaching out, of exploring. In this issue we offer guidance into what may be for you uncharted photographic territory, from which you're bound to emerge with dazzling results. . . .

As anyone knows who's been in a camera store lately, photographic equipment is becoming increasingly sophisticated as mechanical parts one by one are replaced by more compact and efficient electronic components. A new camera or lens can either be a perplexing mystery or an effortless joy to use, depending on the user's familiarity with it. To this end, East Coast Editor **Peggy Sealfon** has written "All About Automation," which shows how to make the most of the new advances in photo equipment. . . .

"Processing E-6 at Home" is intended for color photographers who want more control over the creative aspects and/or cost of color slide film processing. Associate Editor **Bill Hurter's** comprehensive article shows step by step how easy it is with the new E-6-process Kodak Ektachrome Films. . . .

When you're out enjoying a brisk walk after a spring shower this month, you should think twice before muddying up a puddle with carefree splashing—and **Julius Vitali** shows why in "Puddle Photography." With a few props and a free imagination, a quiet puddle can be transformed into a tableau worthy of Dali or Magritte. . . .

Aldo Panzieri has come up with an ingenious, inexpensive alternative to conventional fisheye lenses in "How To Make a Fisheye Adapter." Panzieri shows how a door security viewing lens can be easily attached to an ordinary 50mm lens to provide a 175° angle of view, for a tiny fraction of the cost of a standard fisheye. . . .

Film is a visual medium; what better way, then, to plot your film's course than with a storyboard? In "Storyboarding" Movie Editor **Markene Kruse-Smith** fully illustrates exactly how to use what can prove to be an indispensable aid in planning and executing a film. . . .

In this issue you will also find the third installment of "The Yob System," Contributing Editor **Parry C. Yob's** own successful foray into the tangled wilderness of exposure-development systems. This month's segment concerns "Making and Evaluating Your First Yob Negatives," using the Yob evaluator, whose plans were provided in the March issue. . . .

This month's portfolio comprises the work of **Gregory Alan Robinson**, a young photojournalist who lost his life in the Jonestown, Guyana massacre last November, on his first foreign assignment. Greg's photographs evidence both his integrity as a reporter and the artistry of his visual approach. We are fortunate to have such a legacy from one who left us so suddenly and so soon. . . .

COMING NEXT MONTH:

GET SET FOR SUMMER TRAVEL:

- Shooting in the tropics
- Taking a portrait of a country
- Coping with travel regulations and requirements

PLUS:

BONUS INSERT: Seminars & workshops calendar.

THE YOB SYSTEM, PART IV—As it's applied to practical shooting situations.

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Art Director **Jim Creason** and Associate Editor **Bill Hurter** joined forces to create this month's lively cover photo of model **Carol Cannon** on board the Zephyr. Creason and Hurter wanted to show the bold and true colors that can be had by processing your own Kodak Ektachrome E-6 films at home—the topic of Hurter's article, which begins on page 44. The photograph was made on Ektachrome 64 Film with a Nikon F2AS and 35mm f/2 Nikkor lens. Flash fill was provided via a Vivitar 283 flash unit.

DAMN THE COMPROMISES... MAKE THE BEST PRINTS IN THE WORLD.

Until recently you had to compromise with an enlarger if you wanted to do both black and white and color printing. Why? Consider two facts of life.

1. Most enlargers were designed for black and white printing. When amateur color printing came along, manufacturers added a filter drawer to their conventional condenser enlargers to accommodate color printing. But this compromise didn't satisfy the photographers who were mainly interested in making color prints.

2. In an attempt to simplify color printing, integrating diffusion heads with built-in filters were devised, but they require the removal of condensers. Without condensers, black and white print quality suffers. And color

printing times may be quite long, allowing excessive heat build up at the negative and leaving print quality at the mercy of transient vibrations.

All of the above was very much in mind during the development of the Vivitar VI™ enlarger. It was designed from the beginning to eliminate the necessity for compromises in both black and white and color printing. Of course it's a condenser enlarger, because any experienced darkroom man knows condensers make sharper prints.

The Vivitar VI is a big, rigid, no-nonsense enlarger that handles like pro-lab equipment. The head glides up and down the girder-like box beam column on ball bearing rollers. Constant force counter-balance

springs equalize inertia at all points on the column. There's no slippage, no backlash. Southpaws will appreciate the ambidextrous design... it has both right and left hand focusing and elevation controls. All the optical components are aligned on a heavy column of their own, like a vertical optical bench. The XL column is standard as is the oversized baseboard which allows 16" x 20" prints from 35mm format, two features considered optional extras on some enlargers.

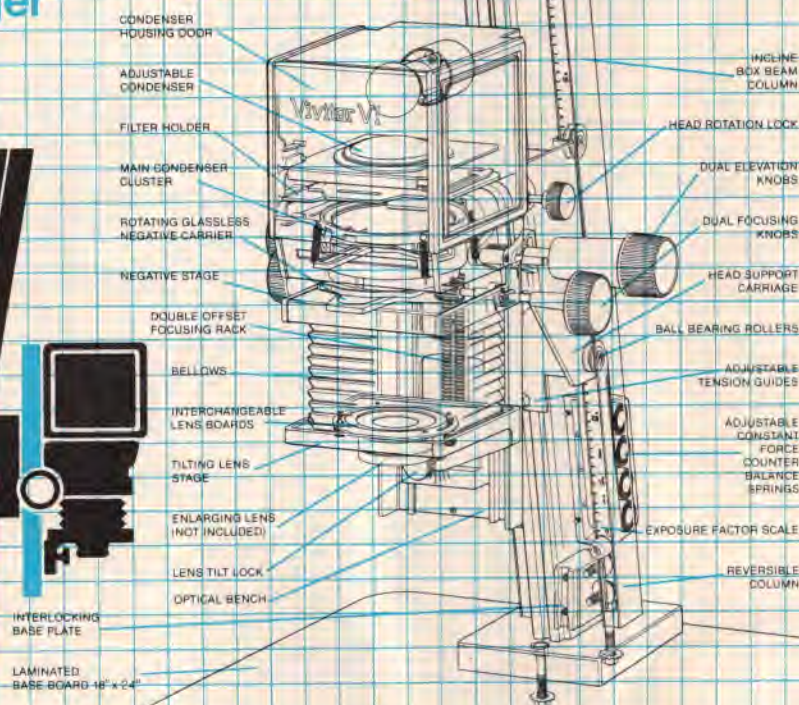
The Vivitar VI will satisfy the most exacting black and white printers including compulsive dodgers and burners and zone system perfectionists. If the bulk of your work is black and white but you occasionally try your hand at color, you can

use an inexpensive color filter pack and get the crisp, saturated color prints only a condenser enlarger can produce. If you find yourself working more with color, you'll want Vivitar's Dioptic™ Light Source. Unique technology makes it the most sophisticated color head you can buy... It's no exaggeration to call it the color head of the future. Check it out for yourself at your Vivitar dealer.

But remember that the Dioptic Light Source can be used only with the Vivitar VI enlarger, so make sure you buy the only enlarger that can grow from a perfectionist's black and white model to an equally high-quality color unit.

Black and White *and* color, damn the compromises. Full speed ahead.

The Vivitar VI Enlarger



Vivitar®

Vivitar Corporation, 1633 Stewart Street, Santa Monica, California 90406. In Canada: Vivitar Canada Ltd., Ltd. ©Vivitar Corporation, 1978

There may be more
major innovations in this
camera than in any
35mm SLR you've ever seen.



The Pentax ME comes from a long tradition of camera innovation.

At Pentax, we practically invented the look of today's 35mm SLR. And we've sold more of them than anyone else in the world.

We were the first to mass-produce 35mm SLRs combining the pentaprism and instant-return mirror. We were the first to use TTL (through-the-lens) light metering. We introduced the first Super-Multi-Coating for 35mm lenses. And we were the first to offer automatic electronic exposure in a 35mm SLR.

At Pentax, we believe our photo engineers have made more major advances in 35mm SLRs than any company in the world.

And we're especially proud of the Pentax ME.

The ME is the smallest, lightest, most compact 35mm SLR in the world. But we didn't achieve this by resorting to plastic materials, like some other leading cameras. The Pentax ME has solid, all-metal cover plates, so it can take a lot of abuse.



Total automation

To free you from as many operational procedures as possible, we've designed into the ME an exposure system so advanced, there is no need to include a conventional shutter speed dial.

Instead, you'll find our unique "shutter control selector." When it's set to "Auto," the ME goes into action as a totally automated, aperture-priority camera. You pick the f/stop. An internal computer picks the precise shutter speed and displays it in the viewfinder.

If you prefer a different shutter speed, simply turn the aperture ring until the speed you desire is displayed. You can do this in less time than it just took you to read about it. And you can do it without taking the camera from your eye.



Once the Pentax ME has decided on an exposure setting for you, you can still override that decision by up to ± 2 EVs. So even if you have a special effect in mind, or a peculiar lighting situation to deal with, you still have superb manual control.

Unlike shutter-priority cameras, the aperture-priority ME gives you full control over your depth-of-field. And even with a bellows or other components attached, the ME still functions automatically.

So even though the Pentax ME is fully-

automatic, it provides as much manual control and creative flexibility as you're ever likely to need.

The Pentax-Seiko shutter

The Pentax ME features a focal plane shutter jointly invented by Seiko and Pentax. It has received considerable recognition for its accuracy, minimal noise and vibration, and durability. This stepless, automatic shutter helps make the outstanding automatic exposure accuracy of the ME possible.



The panoramic viewfinder

We've taken the concept of TTL metering to its logical conclusion in the ME. The first thing you'll notice when you look into the viewfinder is just how big and bright the image is. The next thing you'll observe is a line of 16 small, solid-state, red LEDs. 14 of these indicate the shutter speed selected by the camera. And two of them indicate whether you're under- or over-exposed.

The light meter. A Pentax first.

Of course, no exposure can be more accurate than the light-sensing capability of the camera. And the light sensors in



the ME constitute a major design breakthrough, invented by Pentax in conjunction with Nippon Electric, and first used by Pentax.

They're called Gallium Arsenide Phosphide Photo Diodes (GPDs) and they're a significant improvement over any other light sensor. Even in radical light shifts they react 1,000 times faster than CdS cells. And unlike silicon blue cells, they are immune to infrared radiation. GPDs are extremely stingy with battery power and they can withstand almost any temperature change you'd encounter, without adverse effect. GPDs are definitely the wave of the future. Eventually, you'll probably see them in many SLRs. But we don't mind. We're used to being copied.

Long-lasting power

The two tiny 1.5 volt silver oxide cells will last an unbelievably long time, thanks to the electronic efficiency of the Pentax ME. The camera uses only 3V compared to the 6V required by most other LED readout cameras. Battery life in the ME is expected to last for over 10,000 exposures, even though the batteries power both the shutter and the light meter. You could shoot a 36-exposure roll daily for a year, without battery failure.

When battery power is low, our unique Battery Check Circuit causes the LED visible in the viewfinder to flash on and off, telling you it's time to change batteries. And even when the batteries are dead, you can still keep shooting manually at 1/100 sec. Some other leading 35mm automatics stop operating completely when the batteries die.

Precision lenses

A lot of SLRs have been made smaller lately, but unfortunately, their lenses haven't. Pentax, however, decided to design 19 new ultra-thin, ultra-light M-series lenses for use on the ME. Of course, our regular Pentax lenses also fit the ME. So there are over 40 interchangeable Pentax lenses available to cover any situation, from 2,000mm telephoto to 17mm fisheye. All have Pentax bayonet mounts, which are quickly becoming the standard of the industry. And all have Pentax Super-Multi-Coating, a process which we invented and perfected.



Action shots with the Winder ME

The Pentax ME accepts an automatic winder, the Winder ME, for smooth, quick, automatic film advance. You can attach it in seconds. It fires off exposures at up to 1.5 fps, or if you prefer, one shot at a time.

Dial Data ME back

The back cover of the ME is interchangeable with the compact, easy-to-use Dial Data ME back. With it, you can instantly convert your ME into a data camera,



recording the date, or, if you prefer, technical data such as aperture, shutter speed, and frame number.

At Pentax, we've made more major breakthroughs in 35mm SLR design and invention than any other company in the business. In the Pentax ME, we've continued the tradition. Someday, the advances we've incorporated into the ME may be the standard for all SLRs. But for now, they're only available with the original. The Pentax ME.

For more information write: Pentax ME, P.O. Box 2585, Littleton, Colorado 80161.

PENTAX®

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You still have 9 chances to WIN the SLR Camera of your choice in the

Photographic \$30,000.00 SUPER SWEEPSTAKES

If you're like most photographers, you love a new piece of equipment. Especially a new 35MM SLR. You can't wait to pick it up and put your first few rolls through it. The excitement you feel and the camera's precision add up to an unforgettable



experience. Now, just imagine if that camera were *FREE*. That's what you'll get—A *FREE* 35 mm SLR—if you're one of the 9 remaining GRAND PRIZE winners in the PHOTOGRAPHIC \$30,000 Super Sweepstakes.

PHOTOGRAPHIC invites you to enter the \$30,000 SUPER SWEEPSTAKES and be eligible for 4 SUPER DRAWINGS, 9 GRAND PRIZE SLR CAMERAS. With 1,251 total prizes to win, you just may enlarge your world of photography.

4 SUPER DRAWINGS TO GO

There will be 4 Super Sweepstakes Drawings held between May 30 and August 30, 1979. You've got 9 chances to win the SLR of your choice, plus 1,251 chances to win more great photographic prizes.

Don't pass up this chance to WIN the SLR you've always wanted, or the second one you've always needed.

EXPAND YOUR WORLD OF PHOTOGRAPHY

Why a sweepstakes? For one, we'd like to share our 7th Anniversary with you. Two, we'd like you to know about the lowest price available on PHOTOGRAPHIC MAGAZINE—12 issues (1 year) for only \$5.97—\$4.98 off the regular price and \$12.03 off the single copy value.

Three—we want you to expand your photographic capabilities. PHOTOGRAPHIC MAGAZINE can help you do just that. And you just may win one of the following fabulous prizes:

9 GRAND PRIZES—Your choice of the following top name SLR's.

NIKON FE with F2 lens: Frame, focus, shoot and rely on the camera's electronic wizardry. Exhilarating responsiveness combined with the sheer joy of handling. Small, light, but built solidly to balance perfectly.

CANON AE-1 with F1.8 lens: A compact model of uncluttered photographic engineering. It selects correct exposure to capture the most sudden lighting changes. Fully automatic with manual override.

MINOLTA XG-7 with F1.7 lens: Advanced automation plus MINOLTA quality and compact handling that's amazingly smooth, quiet and comfortable. Also includes manual override.

OLYMPUS OM-2 with F1.8 lens: The only SLR with "off-the-film" light measurement to provide the ultimate in automatic exposure control. Plus, 13 interchangeable screens to meet any need.

PENTAX MX with F1.7 lens: Ruggedness, consistency, adaptability—and not an ounce of extra weight for the photographer who wants full control of his craft.

KONICA T4 with F1.7 lens: With KONICA's famed 3-way exposure system, you have automatic, semi-automatic and manual exposure. Plus an easy-to-use multiple exposure lever for special effects.

45 FIRST PRIZES

45 FIRST PRIZES—Electronic Flash Units.

Rollei 121 BC—Extremely compact automatic computer flash, color-corrected lens for daytime balance, wide-angle coverage.

AIC MK-3A—Automatic range of 3-17 feet; 270 flashes from 4 penlight batteries; weighs only 5 ounces.

Sunpak 300—3 way mount lets you select the most convenient position; 275 flashes with alkaline batteries.

Vivitar 215—A fast 5 second recycle time; automatic exposure from 3-15 feet; plus manual override.

Braun 23B—Light and easy to handle; 250 flashes with 4 penlight batteries; color-corrected horizontal reflector.

72 SECOND PRIZES

72 SECOND PRIZES—110 Format Cameras.

Fujica Pocket 300—Super-sharp ultraviolet filtered lens eliminates haze; shutter set at 1/125 eliminates camera shake.

Kodak Trimlite 28—Sliding lens cover; color-corrected 3-element lens provides sharp picture from 5 feet to infinity.

Minolta Autopak 200—Shoots from 3 feet to infinity; built-in lens cover locks shutter; viewfinder contains low-light warning signal.

Vivitar Point and Shoot 600—Light, compact and easy to use; 3-element all-glass lens and fast leaf-type shutter.

225 THIRD PRIZES

225 THIRD PRIZES—Ambico "Photographic" Camera Straps—Perfect for new compact SLR cameras. Scratch proof, adjustable non-slip backing.

900 FOURTH PRIZES

900 FOURTH PRIZES—Petersen's Big Book of Photography.

THE how-to book. Over 400 indispensable pages with all you need to know about using your camera, plus basic and advanced darkroom techniques.

ALL PRIZES GUARANTEED TO BE AWARDED

Remember, you don't have to order to win a prize. But if you want to expand your creativity, and save time and money—order PHOTOGRAPHIC today.

OFFICIAL SUPER SWEEPSTAKES RULES

1. No purchase necessary. Use attached card to enter. Or, to obtain an Official Entry Certificate, send a stamped, self-addressed envelope to Photographic \$30,000 Super Sweepstakes, 5725 Sunset Blvd., Los Angeles, CA 90028.
2. Seven drawings will be held between February 28 and August 30, 1979, under the supervision of Ventura Associates, an independent judging organization. Decisions of the judges are final.
3. All entries must be received by May 16, 1979, to be eligible for the remaining monthly drawings.
4. For each of the first 6 drawings, you have a chance to win: 1 Grand Prize, 5 First Prizes, 8 Second Prizes, 25 Third Prizes, and 100 Fourth Prizes. In the 7th and final drawings, you may win: 6 Grand Prizes, 30 First Prizes, 40 Second Prizes, 150 Third Prizes, and 800 Fourth Prizes. Total number of prizes—1,668. All are guaranteed to be awarded.
5. Only one major prize to a household. No substitution for prizes offered unless manufacturers release new models of same value or higher replacing those offered. Tax is sole liability of winner.
6. Sweepstakes open to residents of the United States. Offer void in Howard County, Maryland, the states of Missouri and Florida and, wherever prohibited by law. Employees and the families of Petersen Publishing Company, Ventura Associates and their respective agencies and affiliates are not eligible.
7. A list of major prize winners will be available after September 15, 1979. Send a stamped, self-addressed envelope to: Photographic Super Sweepstakes, Winners, Ventura Associates, 101 Park Avenue, New York, N.Y. 10017.

□ Sometimes, when doodling on a typewriter in an effort to come up with an idea for a column, all one ends up with is a page of doodles or, at worst, a blank sheet of paper. Both are dreadful sights, not designed to aid the emotional stability of the beleaguered writer.

Robert Ruark once wrote, "Writing is easy. All you have to do is to put a blank sheet of paper into your typewriter and stare at the page until tiny drops of blood form on your forehead." That's just about where I am now. However, like any other frustrated turnip, I've not managed a single drop of gore. My efforts only resulted in little beads of sweat.

So, being the resourceful type I'm paid to be, I've opted to write about—water! Ah yes, water. Depending upon which part of the country you live in, water can be both blessed or cursed. Droughts and floods notwithstanding, photographers in all parts of the country rely upon water to produce their negatives, prints and transparencies.

But water is usually looked upon as some sort of stepchild—taken for granted and relegated to the scullery. Whereas, in fact, without water we'd all be in trouble. Now there are three types of water that can be used in photography. One is ordinary tap water. Another is distilled water, and the third is deionized water.

Tap water, the most commonly used type, is available at the spigot level. The other types are usually available at grocery stores or supermarkets in little costly plastic containers. One, deionized water, is recommended for steam irons; the other, distilled water, is recommended for purposes that—outside of photography—escape me.

OK, why all the flack about simple water? Because it is the one component in your developers that can affect the outcome of your results. I remember speaking with a devotee of the Zone System who traced a sudden, mysterious inability to get his usual, predictable results to a change in the local water supply. I too have experienced this problem in black-and-white processing and color printing as well. Using purified water eliminated the problems.

Additionally, tap water (particularly in hard-water areas) can cause a number of other unpleasant side effects, like calcium scum on one's transparencies or negatives, after they've dried, that can't be chipped off with hammer and chisel. Even a wetting agent doesn't help that condition. It only spreads the problem uniformly. Using purified water (with a few drops of a wetting agent add-

Guide Lines

PAUL R. FARBER

THOSE HARD-WATER BLUES

ed) as a final rinse after the wash cycle under the tap will completely eliminate the problem.

When matching the cost of clean, consistent results to the cost of distilled or deionized water, who can complain? Yet, if you keep your own darkroom expense records (as I do), you suddenly come to the costly conclusion that buying the stuff at the local market is not the way to go. It all adds up to a pretty penny over the course of a darkroom year.



Perhaps a hammer and chisel or Lime A-Way can remove those calcium deposits on your negatives and transparencies, but using purified water makes for cleaner and more consistent results.

Before getting into the less-expensive alternatives, I'd like to take a few moments to defend tap water. Aside from the fact that it makes a pretty fair mixer, it is also OK for fixers. Additionally, if I sound like I'm advocating the use of purified water for all wet steps in the darkroom, I apologize. I'm not. Fact is, tap water is excellent for color developing rinses. The mineral content (or degree of hardness) prevents the soft emulsion from swelling, thus preventing such unpleasant things as reticulation, or even having the emulsion slip off the film base in great oily gobs. However, I advocate the use of purified water as a final rinse to prevent hard-water spotting.

OK, now to some of the less expensive alternatives. You can boil up a gallon of water to drive off any unpleasant gases such as chlorine. Then, after the water has boiled for a while, decant the water into a clean gallon container and place it, undisturbed, in the refrigerator for 24 hours. Any sediment in the water will

slowly sink to the bottom. Later, you merely decant off the top of the bottle, leaving the last inch or two undisturbed (which contains any "glunkus" in the water). Either that, or you can carefully filter the water, leaving the last inch or two alone.

Speaking of filters, well, they do filter out particulate matter and organic compounds, but they don't begin to touch mineral content such as dissolved calcium or magnesium. Filters are handy, but they don't do the job completely. I'd say to use one, but only after you've followed the boiling and cooling procedure.

Probably the most expensive of the less expensive alternatives would be to buy your own still and distill your own pure water. Edmund Scientific Company (Barrington, New Jersey 08007) sells such an item (catalog No. 80,102) for \$120, which can provide you with two gallons of distilled water every 24 hours. The unit only weighs in at a modest six pounds, takes up very little space, and costs only pennies to operate. If you do a lot of darkroom work, this little gem should be considered. If not, well, perhaps you can distill enough water and sell it to your darkroom buddies for some profit on the side. Either that, or you can get some people to go in with you as partners and share the results.

Perhaps the most reasonable alternative comes in the form of a handy, inexpensive little item usually found in major outlets like Sears or Wards (and even in well-stocked hardware stores). It is called "Kleensteam," and it is sold as a device to produce deionized water for use with steam irons. The unit works on the basis of ion exchange, and as water is poured in one end it runs through a bed of special resins that clean and purify the water. You pour water into one end, and out the other comes pure, clean water. Nice! The ion-exchange resins also have a built-in color indicator. As their usefulness comes to an end, their usually purplish color changes to a light pink, this denoting exhaustion. However, the thing is inexpensive, and replacements are practical.

So there you have it—my quick-and-easy reference guide to pure water for consistent, predictable results in your darkrooms. Although my approach may not have been up to some of the finer moments in photographic journalism, the facts remain the same: Tap water differences throughout the course of a year can make striking differences in your results. Using purified water can make striking changes in the predictability level of your results. □

□ The guiding lights behind Sigma Corporation, one of Japan's leading independent lens manufacturers, are Michihiro Yamaki, the president and founder, and his younger brother, Masao. Both of them seem to have predilections toward lenses and Greek letters. This duo is unique in top administrative circles in Japan due to the fact that even Michihiro, the eldest, is only 45 years old. This may have something to do with the dynamic posture of the corporation.

Michihiro had worked for another lens company in the past and found the field so absorbing that he decided to start his own organization in order to be able to realize his own creative ideas more freely. Sigma Corporation thus came into existence September 9, 1961.

Unlike some of the other independents, who have their lenses made by other manufacturers and merely act as exporters, Sigma has its own factory. Ninety-eight percent of the parts used in the lenses are made in this factory, which is located in Aizuwakamatsu, Fukushima Prefecture, about four hours north of Tokyo by express train.

In addition to a large market in the United States, Sigma also enjoys a good reputation in Europe and such places as Hong Kong, Singapore and, of course, Japan.

Research and development of new ideas is very important at Sigma. This has led to such advances as the early adoption of macro capability for zoom and telephoto lenses; the Filtermatic Series of wide-angle lenses, which incorporate four built-in filters; the Pantel 135mm lens, which can be stopped down to f/64 for extreme depth of field; and the Sigma Scalematic System. The Sigma Scalematic System is used for shooting subjects that are moving rapidly toward the photographer. Instead of trying to focus on the moving figure, it is only necessary to preset the desired subject size on the scale, which presets the focus, and wait for the subject to move into the relevant area. Of course this also works when the subject is moving away.

One more neat little touch found on Sigma lenses is a dual filter mount that accepts two different filter sizes, which increases the chances that the filters you already own will fit the lens.

The giant Sigma Zoom Omega is indicative of the extent to which Sigma technology has developed. This is an f/5.6-11 100-1000mm zoom that weighs about 70 pounds. Lens construction is 13 elements in 12 groups with seven-layer multicoating. Inter-

FOR EAST JOURNAL

BY CHARLES MARAH

SIGMA: THE SUM TOTAL

changeable lens mounts are available to fit most single-lens reflex cameras, and the diaphragm is automatic. Overall length is roughly three feet ten inches.

More practical for the average photographer is the line of lenses introduced at Photokina last year. All of these lenses have seven-layer multicoating, which is standard with Sigma, and fixed mounts. We will start with the shorter focal lengths and work our way up.



1. The 100-1000mm Zoom Omega is nearly four feet long and weighs about 70 pounds.
2. The 21-35mm Zoom Gamma replaces a whole battery of wide-angle lenses.

First is the 21-35mm f/3.5-4 Zoom Gamma. The lens is constructed of 11 elements in seven groups. Size is 2.76 inches in diameter by 2.87 inches in length with a weight of 14.6 inches (417 grams). The angle of view is 63-92 degrees, and minimum focusing distance is 1.5 feet (0.5 meters). Zooming entirely within the wide-angle range, this lens should find acceptance among those who work mainly within this range since it replaces the usual 20mm or 21mm, 24mm, 28mm and 35mm focal

lengths in one compact package.

Next is the 35-85mm f/2.8-4 Mini-zoom Alpha with macro capability. Construction here is 11 elements in nine groups, four of which are moved by four cams in a new zoom design. Like the Zoom Gamma described above, separate rings are provided for zoom and focus. Minimum focusing distance in macro mode is about ten inches; weight is only 13.5 ounces (380 grams) with a length of 2.93 inches and a diameter of 2.5 inches—another very practical zoom lens.

The Sigma Zoom Beta, a 70-150mm f/3.5 with macro capability, incorporates a new idea: Instead of two rings for zoom and focus there are now three! While this may seem confusing at first, the idea is that the third ring, located between the other two, can be used to engage either the zoom or focusing ring as desired for faster action. There are 12 elements in nine groups, and minimum focusing distance is about 1.8 feet.

The 100-200mm f/4.5 Zoom Kappa has ten elements in six groups and includes macro capability. A single ring serves for both zoom and focus in this case. With an overall length of 5.6 inches and a weight of 20 ounces (560 grams), the lens is quite easy to use. This is considerably smaller than many zoom lenses with smaller maximum apertures.

As we continue moving to longer focal lengths, we find the 75-250mm f/4.5 Zoom Delta and 120-300mm f/5.6 Zoom Lambda lenses, both with macro capability. The construction of these lenses is more complex, with 13 elements in 10 groups for the Delta and 14 elements in 11 groups for the Lambda. Both are listed in the spec sheets as having "one-touch, three-action" rings.

The Sigma Minitel 235, a 200mm f/3.5 telephoto, features quick focusing and macro capability in a very compact design. Actually, this seems to be a new version of an old model that has been available for some time. The major difference is that the old model could be focused from infinity to six feet with a turn of only 36 degrees, while the new one focuses to about three feet with a turn of 85 degrees. Perhaps the quicker focusing system in the earlier lens was too fast for practical use.

Last is the Sigma Scalematic 300mm f/5.6 telephoto. Its most outstanding feature is the Scalematic System mentioned above.

Almost, but not quite, forgotten is a new Sigma tele-converter called the "Tele-Macro" with seven-layer multicoating on its elements. Magnification is 2X. *Sayonara!* □

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PhotoGraphic April 1979 11

□ Countless photographers have made a successful transition from stills to motion pictures. In fact, filmmaking is a logical next step for any fairly competent photographer, amateur or pro. The field enables a photographer to expand his/her current repertoire of technical skills while exploring a challenging new means of expression. Although they involve similar tools and techniques—camera, lens, film and darkroom or lab—still photography and motion pictures are quite separate forms.

The difference between the two means of imagemaking centers in the fact that a movie is actually a series of still photos strung together on a ribbon of acetate. When a sequence of progressive images is filmed, then projected at 18 or 24 frames per second, the eye is fooled into believing that a picture is moving. This phenomenon is called *persistence of vision*; it allows us to see movies as lifelike, motion-picture experiences and demands that we *film* movies with an approach that's somewhat different from the way we shoot stills.

With 35mm single-lens reflex in hand, the still photographer sets out to capture the quintessential image, that one "decisive moment" that will forever freeze his subject in time and space. Each still picture has the possibility of becoming a single symbol that will strike one resonating note in the hearts and minds of viewers, an icon representing a split second of captured reality. Trained to see the world in frames, a good photographer can compose an image, focus and shoot in one continuous reflex action. Ideally, this quick, automatic movement is a habitual response to any situation with apparent photographic possibilities.

Because of these innate talents and carefully honed skills and reflexes, anyone with a still photo background enjoys a marked advantage over photo beginners who aspire to success with motion pictures. The accomplished photographer is no novice imagemaker. But even a very basic knowledge of cameras and photo processes can be an invaluable asset when you want to master the art and craft of making films.

Photographers-turned-filmmakers are nearly always delighted to discover that with movies they acquire a larger palette with which to "paint" their ideas, dreams and observations. Rather than stalking the one elusive fraction of a second when the elements of a photograph all come together, the filmmaker thinks in terms of time and motion. At first there's a tendency to visualize each scene in

FOCUS on Filmmaking

MARKENE KRUSE-SMITH

GETTING INTO MOTION

the movie as a still picture. But eventually, a higher awareness sets in.

With movies you have to add close-ups, panning, zooms and eventually, sound. You get to move the camera and to see the results of that movement on screen when the footage is projected. You realize that form—pacing, sequence, point of view and the timing of shots and scenes—nearly always affects content and the way your subject will be seen by audiences. Motion pictures



ILLUSTRATION BY JIMMIE WEST.

The quintessential image, that one "decisive moment" that will forever freeze the subject in a time and space, does not exist for cinematographers. Camera and subject movements are encouraged, even choreographed, in motion pictures. Movies can reveal the beauty of a series of moments in time.

add a whole new dimension to the imagemaking process—literally.

Still photographs have two dimensions, length and width; their third space coordinate, depth, is implied by perspective and depth of field. Movies, however, exist in a world of the fourth dimension—time—and this is what makes them so intriguing. But the difference between stills and motion pictures is not just conceptual. On a practical level, the differences between the two kinds of cameras dictate, to no small extent, the difference in the way you'll perceive your subjects. This brings us to a simple comparison of hardware.

When you look closely at a super 8 movie camera, some similarities with your still camera will be immediately

evident. First of all, the movie camera will most likely be a single-lens reflex. What you see through the viewfinder is what you'll get on film, since you are actually seeing through the lens of the camera. Second, although some 35mm still cameras feature total exposure automation, nearly all super 8 models are completely automated. A notch in the film cartridge automatically sets the ASA. Turn a dial on the camera body to the sun symbol and the built-in 85 filter flips into place for shooting in daylight; turn toward the lightbulb symbol and the filter's removed for shooting indoors. Add to these features a convenient back-light button and an incredibly sensitive electric eye, plus manual override for filmmakers who prefer to be on their own.

While your still SLR is meant to be held by its body with both hands, super 8's all have pistol grips for easy one-hand operation. The spare hand is left free to hold the microphone, zoom in or out or gesture to your actors. Rather than pushing a button on top of the camera to take a picture, you squeeze a trigger to expose movie footage. At first it may be tempting to turn the movie camera sideways, especially if you're into vertical composition. No matter how enticing the thought, it's better not to succumb unless, of course, you really wouldn't *mind* having subjects appear to climb the walls!

Loading the super 8 proves to be an exercise in simplicity. Open the door on the side of the camera, pop in a movie film cartridge, close the door and you're set. There's no winding from spool to spool—in fact you never actually touch the film. Want to switch from black-and-white to color? Film can be removed from the camera and reinserted at any time without losing more than a couple of frames.

What still photographer, once initiated into the incredible world of wide-angles, macro close-ups and telephoto lenses, would ever give up a painstakingly collected system of interchangeable lenses? You would, if you could get a single, built-in zoom lens with a tremendous variety of focal lengths. Most super 8 models feature noninterchangeable optics, resulting in a twofold savings to moviemakers. First, there's no fumbling around in a gadget bag for a particular focal length lens while your subject moves out of view. Next, you'll be spared repeated visits to camera stores to purchase that one extra lens that will round out your previous acquisitions and augment your system. With super 8 models, the system comes with the camera. □

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☐ The saying that you can't teach an old dog new tricks certainly applied to my bull-headed assistant, Eddie Kazinsky. I never taught him anything! Eddie, however, taught me some tricks that were amazing. Take the case of the jewelry catalog:

The catalog was what is known as a "bread-and-butter" account. No fancy shots and no fancy prices. Just straight, well-lit, descriptive photographs at \$20 apiece. The nice part of this particular job was that there were over 100 shots. If they could be done quickly and efficiently, the job would be a profitable one. The bad part was that because jewelry is metal, it is difficult to light. That's why I spent so much time telling Eddie how to build a light tent—a specialized device constructed of matte acetate sheeting that provides an even, directionless, overall lighting that is perfect for metal. Once we had the tent, the jewelry could be fed through it, assembly line style, and shot without the need for constant lighting adjustments.

Eddie, much to my surprise, hadn't argued about building the tent. He'd pocketed the money I'd given him for the materials and promised to have it ready the following morning. Now it was the following morning. I'd returned to the studio and found Eddie slumped in a chair, sipping coffee from an oversized styrofoam cup, and obviously suffering a monumental hangover.

"Where's the tent?" I asked apprehensively, as I scanned the empty studio.

"Tent?" asked Eddie.

"The light tent!" I demanded.

"Where is it?"

"Oh, *dot* tent," exclaimed Eddie in his thick Russian accent. "Make now," he said, rising unsteadily to his feet.

"Now!" I shouted. "We should be shooting now!"

Eddie ignored me and stumbled to the sink. He threw cold water on his face, rinsed out his coffee cup, and started to dry it off.

"That's great," I snapped. "It's going to take hours to build the tent and you're wrapped up in housekeeping!"

Eddie ignored my sarcasm. He finished drying the cup, turned it over, and cut a round hole in its bottom. He then got out the camera and jammed the cup, as if it were a lens shade, over the front of the lens. He

SELF- assignment

BEN HELPRIN

THE "KAZINSKY" TENT

put a piece of jewelry on the table, placed the cup and camera over it, and lit the outside of the cup with a spotlight. "So," he said, gesturing at the setup, "shoot already!"

I looked through the prism of the camera's viewfinder. The styrofoam diffused the light and spread it around the cup's entire perimeter. The jewelry was beautifully lit!

"Eddie," I said, "you're amazing."

"Dot'z zo," he agreed.

"And," I added happily, "you've saved me money."



This camera is equipped with a "Kazinsky" tent—an easily made item that provides ideal lighting for shooting shiny objects. Instructions for its use are given in text.

"What money?" asked Eddie.

"The money I gave you to get the tent materials."

Eddie looked surprised. "You don't like diz tent?" he asked, pointing at the cup.

"Sure," I said. "It's great."

"Work like your tent?"

"Better," I replied.

"Good," said Eddie. "Same price."

It suddenly came to me how Eddie had afforded his hangover! I never did get my money back, but Eddie's tents (he made a number of them in different sizes) were worth the price. They worked perfectly and the catalog was shot in record time. Thus, this month's assignment:

Construct a "Kazinsky" light tent and use it to shoot a shiny, highly reflective (metal, plastic, etc.) subject of your own choosing.

Construction: Any cylindrical white-styrofoam container (a small coffee cup, large milk-shake schooner, or even an extra large styrofoam flower pot) works well. Turn the container over and place the front of your camera's lens squarely against the center of the container's bottom surface.

Use a sharp pencil to outline the circumference of the lens. Don't overdo it. The cutout should be just large enough to accommodate the front of the lens barrel, and the fit should be a tight one. Then place the whole assembly over the object to be shot.

Camera: Your camera, of course, must have close-up capabilities. A special macro lens is ideal, but your regular lens, equipped with extension tubes, bellows, or "portrait" accessory lenses, also works well.

Lighting: A spotlight or tensor lamp works most efficiently, but a floodlight or even direct daylight will also produce excellent results. Position the light slightly high and aim it directly at the tent. One light is usually sufficient; but if absolutely even, non-directional light is required (or if you're using a translucent plastic, rather than a Styrofoam container), you may want to try using two lights positioned at opposite sides of the Kazinsky tent.

Exposure: Determine the exposure by removing the subject and slipping a standard 18-percent-reflectance gray card under the tent. Point your meter through the tent's cutout opening to obtain a reading. Replace the subject and, if you're shooting in color, use the exposure indicated by the meter. If you're shooting in black-and-white, decrease the meter's indicated exposure by one full stop and overdevelop the film by 30 percent. (Note: If you're using a handheld meter rather than a built-in camera meter, be sure to compute any necessary "bellows-extension" factor.)

Refinements: In shiny-object photography, the camera's lens is often seen as a reflected image appearing on the surface of the subject. The location of this reflected image depends upon the subject's angular relationship to the axis of the lens and can be altered by using hidden supports (such as small pieces of modeling clay) to tilt the subject in various directions. Bright specular highlights can be produced on the surface of the subject by punching small holes in the side of the tent that is being directly hit by the light. All these effects can be checked easily and adjusted visually before taking the shot.

That's all there is to it. The "Kazinsky" tent is the quickest, simplest and least expensive method I know of for lighting shiny objects. So, as Eddie would say, shoot already! □

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□ Color temperature is easily one of the most confusing and misunderstood topics for photographers everywhere, but it's nevertheless one of the most basic subjects of concern to anyone who ever shot a roll of color film. It affects not only what film you put in your camera, but also what kind of light you are shooting in and, once in a while—if the two don't match—the use of accessory filters for correcting the balance.

Granted, the term itself, "color temperature," sounds like a comparison of apples and oranges. In fact, however, the idea is to describe color very precisely by basing the description on something universally concrete. Even though the description is given in degrees, what we are describing is really the quality or visual appearance of light.

You may recall from "The Language of Light" (see "Tools of the Trade," January, 1979 issue) that when objects are hot enough, they begin to glow; when this happens we say the object (any object) becomes incandescent. If we heat the object even more, the color will change. If we again heat it further, the color will change again. This directly variable relationship is the basis for color temperature, and it is calibrated with a "black-body" radiator.

The most comprehensible description of this process I have found comes from *Successful Color Photography* by Andreas Feininger:

The standard black-body radiator is a small, completely enclosed oven made of fire clay with a tiny observation hole in one side. It derives its name, "black-body radiator," from the fact that any light falling on the small opening from the outside is completely absorbed within the cavity of the oven. As a result, this opening appears as perfect black. No ordinary surface can ever appear as black as such a hole, since even the blackest surface reflects a certain percent of the incident light.

As a black-body oven is heated to incandescence it begins to glow deep red inside the oven. As it is heated more and more, the color changes through the spectrum. The changes are observed through the tiny hole. Feininger goes on to say, "Since it is unaffected by any outside light, this light can be used as an absolute standard for relating temperature and color."

The first color temperature experiments were the brainchild of British physicist Lord Kelvin. Today, color temperature measurements are made in *degrees Kelvin* (K), which are the same increments as Celsius degrees

TOOLS OF the TRADE

KAREN SUE GELLER

LIGHT AND COLOR TEMPERATURE

but begin at absolute zero, -273°C (the point at which all molecular activity stops). It is interesting to note that whereas we often speak of red as a warm color visually, its color temperature in light terms is around 1000°K . The color blue appears to be a cool color while in light it rates 27,000 degrees on the Kelvin scale.

Since color temperature numbers can be unwieldy, a unit called the "microreciprocal" degree or *mired* is often used to simplify filter selection.



What is the temperature of red? No idea? See the text.

"A mired value is equal to 1,000,000 divided by the color temperature. For example, a 3400°K photoflood lamp has a mired value of $1,000,000 \div 3400 = 294$," as defined in the Kodak *Encyclopedia of Practical Photography*. Since blue filters raise color temperature and yellow or amber-colored filters lower color temperature, assigned mired values allow light balancing to become a matter of simple addition and/or subtraction. Here is what the *Encyclopedia of Practical Photography* recommends:

Subtract the mired value of the film's color temperature balance from the mired value of the light source. If the answer is a positive number, a yellowish filter with that positive mired shift value is required to lower the color tempera-

ture of the light. If the answer is a negative number, a bluish filter with that negative mired shift value is required to raise the color temperature of the light.

Strictly speaking, only light from a heated filament can be expressed in color temperature. Different light sources such as tungsten lamps, flashblubs or other light sources are made of different materials and have different color temperatures. Our eyes adjust and compensate for these differences, but films do not. Color films are designed to record correctly at 3400°K (Type A films), 3200°K (tungsten films) or 5500°K (daylight films).

As a convenience in describing color, this concept is a valuable and useful reference. Daylight, though not a true measure of color temperature (since it's not from a heated filament), varies in color temperature throughout the day from early dawn to dusk. Approximate values range from around 2000°K at sunrise or sunset to well over $10,000^{\circ}\text{K}$. A change of 50°K represents a visually perceptible change while 200°K is a significant color shift. It is important to note that the 5500°K rating for daylight films is an average figure.

Some lights cannot be visually matched with a black-body radiator, and therefore, no value can be assigned. This is the case with the greenish light from mercury arc lamps. Fluorescent lights, on the other hand, like daylight, can be assigned a value but pose a particular problem for photographers. Fluorescents are particularly tricky because the color changes with the type and age of tube, the tube's manufacturer, the voltage, the kind of diffuser placed over the tube, and how long it has been on or lighted when you take a temperature reading.

Some manufacturers sell filters for use with fluorescent lights to balance with daylight or tungsten films, but you can easily see that these do little more than get you into the ballpark, so to speak. Kodak offers a handy chart for filter correction, which is broken down to the six popular types of fluorescent tubes. That is a little better, and OK if you know what kind of tube you're shooting under. How often—in reality—is that true?

So alright, some of the misconceptions and confusion about color temperature are gone, and (no pun intended) the light begins to shine. Are you at the mercy of all these physical phenomena? Of course not, and next month we'll examine some of the various products and techniques you can use to bring color temperature under control. □

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□ There's something new (relatively new) on the electronics horizon that I want you to know about.

In the early days, home recordings—any kind of recordings—were made on a record disc with cutters. Then, for a brief glimmer, came the wire recorder, which offered all sorts of additional benefits, including the opportunity to spend countless hours trying to respool the wire when it got itself loose. This was quickly followed by our present oxide-coated tapes, and it seemed that, like Kansas City, we had gone about as far as we could go!

Now there's something new once again, and it promises to set the world of recording on its ear.

It all began some 13 years ago, when 3M began work on what has come to be called "metal-particle tape." 3M calls their own product "Metafine," or, more particularly, "Scotch Brand Metafine." The early experiments were difficult. The first coating material would burn up on contact with ordinary air. Then, when they got that problem licked, they found out that when the tape was slit, it would actually rust at the slit edges. But I've been informed that all of these problems have been licked, and it's go, go, GO!

What does it all mean? Several important things. For one, the output is about four times higher than that of ordinary chrome-oxide tapes, and that, in turn, means you can get the same quality by using a tape one quarter as wide! Interpret the same statistic differently, and it means that miniaturization is on the way. The recorder designed for a tape 1/4-inch wide will need a tape only 1/16-inch wide. Take this a step further, and newer, smaller reels or cassettes are possible. Reduce the size of the reels or cassettes, reduce the electronic package that goes with it, and you'll soon see that ultrasmall recorders—with the same audio quality—will be possible.

My own feeling is that the biggest impact will be in the field of video recording and playback. What you must understand is that in any tape device, the more output you get, the wider the tape must be, or the better the coating material must be. By improving this coating, the 1/2-inch video tape can be reduced to one quarter that size, or only 1/8-inch wide, to accomplish the same thing. Reduce the width of the tape, reduce the size of the cassette, and—if you can—reduce the size of the electronics package, and you'll soon be able to see video recorders that use a cas-

ELECTRONICALLY YOURS

BYRON G. WELS

A MODERN MIRACLE IN MINIATURE

sette the size of a present-day audio cassette, and we aren't talking about the eight-track jobbies, either!

There's another factor involved here. While the new metal-particle tapes may cost a bit more at the outset, until the factor of competition comes into play, a metal-particle video cassette will actually be using a narrower tape, and therefore, the cost of cassettes for video will also be markedly reduced.

But don't start to worry yet.

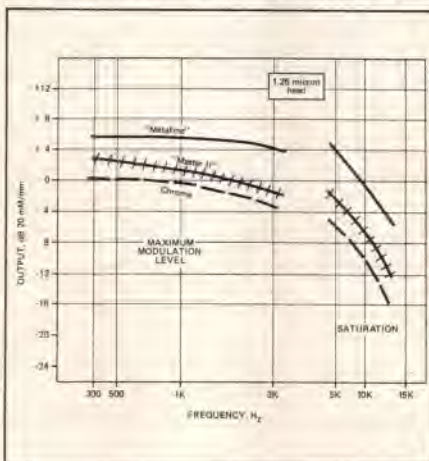


Chart shows maximum output (at optimal bias), through audio spectrum, of typical chromium dioxide, Scotch Master II, and Scotch Metafine tapes.

There's also a question of compatibility. It isn't a two-way street. While you can use the new tapes to playback on your old equipment, you will not be able to record or erase. You'll need a new set of heads and some new circuitry for that. Chances are those of us who have rather costly and elaborate equipment will be able to have that equipment modified for the new tapes; the larger group will simply phase out the old and ring in the new. And the new equipment will indeed handle your old tapes. The changeover, in other words, will be evolutionary, not revolutionary.

As with any drastically new product, the manufacturers always seek out the widest possible market to ensure its success. The higher output of the new material makes the greatest target market the audio-tape field, and obviously that is where the first thrust is going to be. The first tapes available will be for the cassette field,

both in cassettes and in eight-track. But after the new tape is well ensconced here, you can look for a rapidly burgeoning leap into other familiar areas where tape is employed. As was mentioned before, the tape can make deep inroads into the video-recorder field and equally enormous strides into computers.

Computers deserve a good look here, too. There is no reason, for example, why the selfsame material cannot be applied as the coating on a computer floppy disc. The greater output offered by the metal-particle coating is going to make great inroads wherever tape is used.

The new material was introduced in June 1978 and has been selling in Japan since December. At the recent Consumer Electronic Show held in Las Vegas in January, seven compatible tape decks were shown. In Japan in October, 16 companies showed compatible equipment.

Every once in a while, the consumer electronics field will come up with something new and startling that offers a shot in the arm to the business, spurring on newer and greater sales. It happened with the advent of the transistor, again when stereo came to be, and once more when artificial reverberation was offered—the latter passing almost into obscurity—and now we have metal-particle tape. This one is going to be around for a good, long time and will almost of necessity change the entire industry.

In my own opinion, metal-particle tape has immediate application to existing needs. However, we can look a bit ahead and see that metal-particle tape is a solution looking for problems. It is the answer to problems as yet undiscovered, and once we have used it to improve the things we now have, we can depend on new products for our ease and comfort that will result from this new technology.

What kind of things can we look forward to? You might find ultraminiature audio recorders built right into movie cameras. You might be able to find a camera with a built-in computer and tape memory system to assist in establishing the critical parameters of exposure and color temperature. It could provide, with full automation, the necessary reminders to set the things that must be set on cameras, without the need to remember to set them, even on automatic cameras.

Nobody can say with any assurance where metal-particle tape is going to take us, but I, for one, am glad it's here. □

☐ Just as most leases or rental agreements favor landlords, book contracts or agreements usually favor publishers. While much of the language in a book contract is standard, it would be foolhardy not to make a complete study of it prior to signing; otherwise it is likely to come back and haunt you at a later date. It is well within a contractee's province to make deletions and amendments he/she believes are necessary to protect his/her interests. And it is not unusual to have a contract go back and forth several times for corrections and initialing. The signing of a book contract is not to be taken lightly; and arriving at a mutual agreement is simply the means of compromise between author and publisher.

Some contracts are very simple. Other contracts may go on for pages in which things are spelled out in great detail, not necessarily in favor of either party. In view of this situation, I feel it's necessary to cover certain items often found in contracts that if overlooked could prove detrimental after the contracts are signed.

Copyright: Be certain the contract specifically states the publisher will take out a copyright of the work in the author's name, in the United States and other countries. You can expect no argument with this.

Delivery of manuscript: The manuscript, containing approximately X thousand words (in triplicate) plus X illustrations, must be delivered to and accepted by the publisher at a certain date. If you anticipate that you might be late, notify the publisher in writing while at the same time requesting an extension of deadline.

Royalties: Assuming everything is in order and your material has been accepted and made ready for publication, *the publishing must be done at the publisher's own expense.* Some publishing houses are referred to as "vanity publishers" because they publish books at the author's expense—hence the term "vanity." Be sure you don't get caught up in such a situation since the likelihood of receiving royalties is almost nil. Nonetheless, from first-class publishers you can expect the following royalty percentages: 10 percent of the first 10,000 copies, 12½ percent on the next 10,000 copies, and 15 percent thereafter.

Advances: Some publishers will attempt to reclaim all or part of the advance in the event sales are below expectations or below the advance itself. Example: You received a \$5000 advance but initial sales only came to \$4000, in which case the publisher would expect the return of \$1000. Do

WHERE THE ACTION IS

DAVID SUTTON

BOOK CONTRACTS

not accept this clause! Change it to read that if after publication the proceeds from the sale of the book are less than the advance payment made to the author, the author shall have no responsibility to the publisher for any deficit. This is an important amendment—exercise your rights!

Other rights: Quite often, compensations are received from the sale of subsidiary rights, and they are generally divided equally between the author and publisher. Some of the cate-



Hobbies make good subjects for books. I have written and illustrated several books on model railroading. In each contract I made certain I retained exclusive ownership of text and photos. As a result, I have been able to use this photo repeatedly. © David Sutton

gories include: digests and condensations, reprint editions through another publisher, second serialization, syndication, translation and foreign-language publication, publication in the English language outside the United States. These and several others are usually acceptable; but if you can persuade the publisher to permit you to retain all of these rights or at the very least arrange a more favorable percentage rate in your behalf, so much the better.

Definitely delete the following: "Novelty or similar commercial use of the work or material based on the work." Also, "First serialization in North America," or "Motion picture, dramatic, radio, television, mechanical rendition and/or recording." Don't delude yourself into thinking that any of these deletions are far-fetched. We live in an electronic world of communication, and with the advent of the now-popular home video-tape recorders, companies are looking for all sorts of material to provide features for entertainment and instruction. It is not inconceivable that your book might make the basis of a tape-recorded program.

Therefore, be certain you retain these rights completely.

Material supplied by the author: In addition to supplying the manuscript, the author must provide a title page, preface or foreword plus necessary art work in the form of photos, diagrams, illustrations, charts, etc. If the author fails to do so, the publisher shall have the right to secure such artwork elsewhere and charge the costs incurred against any sums that may accrue the author. To prevent this the author must specify that he/she will be the only source of supply for all art work. Obviously the author must be certain to provide all the art work in question, otherwise the publisher may go elsewhere. The author should also indicate that any or all portions of the matter supplied must be returned intact.

Free copies: As a rule, most publishers will provide approximately six copies to the author and any additional copies at a 40-percent discount off the regular retail trade price. (I requested and received 24 free copies of my last book since the extra books were used for promotional purposes.)

Revision: This heading may contain a slew of legalistic jargon whereby should the publisher decide to update or revise your book, you would not receive any advance compensation and/or the publisher could turn to another author to do the work, who in turn would share in the royalties and credits. Delete the entire passage and change it to read that you will agree to revise the work on request of the publisher *on terms to be arranged.* This will not only guarantee you additional payment but protect you, your successors and assigns should anything happen to you.

For those of you who are contributors only—e.g., providing one or more photos to aid in illustrating a book—it isn't likely you will see a contract of any sort unless you are literally illustrating the book, your photo(s) is in extremely great demand, or it's so valuable it will increase sales of the book in which it appears. In such a case you are in a position to make various demands. Other than that, cover payments range from \$250 to \$500, and for inside use you can expect \$50 to \$200. Prices are determined on the basis of whether the work is color or black-and-white, and content. The publisher will expect unlimited use for any and all future printings. Resist this if you can!

Self-publishing will be covered next month, and I will also reveal additional tricks of the trade concerning the signing of a contract. ☐

Thinking along the lines of our highly organized society, the reader might infer that the monthly writing of this article is somehow meshed into the routine of a busy publishing house. However, I am not seated at a desk surrounded by other writers in the traditional office format. Nor am I writing this at home in the disciplining confines of my office. In fact, I am relaxing at the typewriter while seated in my bubble-top van, which is parked in a snow-covered campground about 50 miles from Los Angeles and about a mile above it. There are no telephones or TVs, and my only concession to modern communications is a stereo tape player. Just yesterday, I gave the last exam of this semester, and I am tired, as are most of my university colleagues at the end of a busy school term.

I am looking out the window, reflecting on last year and the promise of this one. My thoughts are influenced by the quiet beauty of the clear, cold starlit landscape. The sheer exhilaration of being alive encourages the surfacing of all capricious but well-intentioned resolutions for the rest of this year. Perhaps you will forgive me for imposing on you, several months into 1979, some resolutions that I believe would be beneficial to both photography and photographic education. Here goes:

Why not organize a National Photography Week? Considering the incredible impact of photography on our culture, it seems only fitting (and long overdue) that we dedicate a week of observance and activity to celebrating this magical medium of communication. What a wonderful annual occasion this could be! Across the country, prime examples of the art and science of photography would be displayed in public and private galleries, libraries, banks and shopping centers. The work would demonstrate the spectrum of the photographic image from the poetry of the artist/photographer through the professional presentations of the commercial and portrait photographer to the serious, self-revealing, avant-garde images of the student. What better way to alert the public to the contributions of the photographer whose product, the visual image, has become a necessary, if not generally recognized, national resource? What more appropriate way could there be to acquaint people with the diverse contributions of photography to our culture?

How should we go about it? Since extensive support would be needed, perhaps a national organization such as the National Photography Instructors Association (NPIA) could be an

camera ON CAMPUS

ROBERT ROUTH

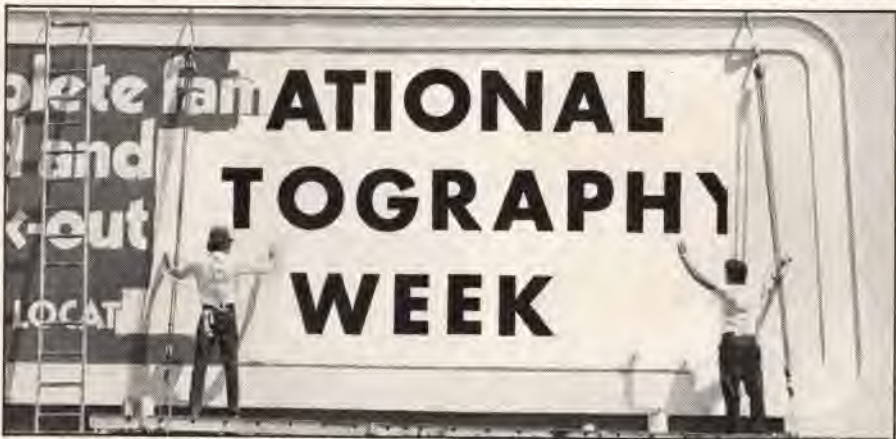
MIDYEAR RESOLUTIONS

originating body, setting the dates and initiating projects among its members and the schools they represent. The Professional Photographers of America (PP of A) should need little encouragement to join such an event that would publicize the organization's activities and spotlight the members and their work. It should be of interest to the 16,000-plus membership of the Photographic Society of America (PSA) in fulfilling their objective of supporting the arts and

historical societies. A much-needed fringe benefit of the project would be the visibility and attendant publicity for this photography class project at a time of educational cutbacks.

It seems a tragic educational loss that most of our photography students have been deprived of actually seeing the exquisite detail of a daguerreotype, the surfaces of a calotype or platinum print, or other examples of past techniques. Perhaps through an assignment such as the one suggested here, our students could enrich their own lives and make a significant ongoing contribution to their community.

A second project that might be of special value to photography education is the assembling of a national collection of original photographs selected for historical and aesthetic importance and to reinforce textbook



PHOTO/ART WORK BY BETTY AND BOB ROUTH.

sciences of photography. Other photography organizations, camera clubs and related interest groups should be interested in participating in this celebration.

In anticipation of the first such annual event, photography educators could assign projects of collecting, identifying and cataloging historically significant photographs and equipment located in the students' own neighborhoods for future classroom, library or gallery displays. Historians agree that the photographic heritage of our country is far from complete. Countless images representative of obsolete techniques still remain stored in closets or forgotten in attics, waiting to be acknowledged for their historical value. While some owners of such memorabilia might be reluctant to part with these items, there should be little difficulty in obtaining relevant examples for an occasional exhibit or classroom study unit, especially during National Photography Week. The locating, classification and cataloging of historical photographs could be aided through the support of local newspapers and

references. This collection, pertinent to university as well as high school photographic education, could be made available at little or no cost upon request, for regional exhibits, bringing to hundreds of students the opportunity to see authentic chronological examples of their photographic heritage. This collection could possibly be financed by a shared grant from manufacturers and distributors of photographic equipment and supplies and encouraged by a well-organized letter campaign requesting support for this important educational resource. One major educational institution has already offered to fulfill the function of selecting, storing and distributing a collection that would be a visually eloquent testimony to the interest manufacturers and dealers have in photographic education—a tangible expression of their concern beyond merely profiting from students whose continuing interests in photography will sustain the continuing use of materials and equipment.

Perhaps you have some comments or additional ideas. If so, why not write me? □

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☐ My photographs lack style. That is not to say they aren't acceptable pictures. They serve their purpose adequately enough, whether to record scenes and people I want to remember or to illustrate articles I write. What disturbs me about them is that *anyone* could have taken them. They lack distinction and don't reflect me, the picture-taker.

Style does not develop magically. It is not a quality that some have and others don't. It takes strong motivation. Friends who love taking souvenir pictures on vacation and exhume their cameras twice a year will never have style. They're perfectly content with snapshots (and I can enjoy looking at them, too). But in my work I want more.

Style requires confidence. You have to risk sticking out your neck. In fashion, style is the difference between someone who follows the flock by wearing fashionable clothes and someone who wears clothes in a characteristic way that makes them fashionable. The stylish one must be secure in his taste and single-mindedness to endure the sniggers often uttered by observers. He's the trend-setter who marches to the beat of a different drummer—and survives.

But individuality is often criticized. Most outstanding photographers of our time are staunch individualists and are regarded askance at one time or another. Robert Frank was the brunt of much controversy in the late '50's when his book *The Americans* was published. He recorded a cross section of the American population with a stark realism that many viewed as a deliberate twisting of subject matter. His work has since been acclaimed for its influence on contemporary photography.

Robert Frank exemplifies a photographer who has style. His point of view is opinionated and unique. He once said, "If the photographer wants to be an artist, his thoughts cannot be developed overnight at the corner drugstore." Frank is decidedly an independent spirit. He is quick to voice dislike of mass *anything* and mistrusts group activities.

I have never been a joiner either. Organized photography groups are for those who want lots of social interaction and fun combined with photography. Not for me. I find that groups—though worthwhile to a point—stifle my originality. Noted photographer George Tice once belonged to a photo club. He valued the information he gleaned on the craft of photography—about print quality, darkroom techniques, composition, etc. But when he began to feel confined by the "traditional kind

In sight PEGGY SEALFON

HAVE YOU GOT STYLE?

of imagery," he abandoned club life. "Everyone strived to make the same kind of picture," he complained.

Different strokes! Each of us has to decide what we want out of photography. What is its purpose in our lives? How important is it? How much spare time is devoted to it? How passionate is the involvement?

Style grows out of personality. Wynn Bullock has been described as a "gentle man, warm and pure of spirit," who had a "deep involvement



A pretty scene of New York City's Central Park makes for an OK image at best. It is merely a record and has no distinctive style. © Peggy Sealfon

with the mysteries of the existential being of things." His highly interpretative style reflects this philosophical character. He was a constant searcher and his beautifully rendered photographs explore the natural world and man's relationship to it. He never could have taken the disturbing, confrontational portraits that typified the work of Diane Arbus, who committed suicide in 1971.

Knowing thyself is a step toward style. If I were a confirmed misanthrope, I know I'd make a lousy photojournalist because my pictures would be devoid of human compassion. Even though I'm not a misanthrope, I still know I could never be a photojournalist because of other

traits of mine. I could no more bulldoze my way into a threatening situation to get the picture than I could play forward for the New York Knicks. I'm not aggressive enough, and physically I'm too petite. I realize I'm far more comfortable photographing nature and people I know or meet, or exploring new places.

Each of us has his/her own set of likes and dislikes and individual complexities. We each need to examine (and admit to) our attributes and limitations. Self-analysis helps us to understand what affects photo style (and life style, too).

Curiosity and a sense of adventure are also traits that contribute to style. Successful photographers have an insatiable desire to get at the essence of something, whether it's animal, vegetable or spatial. They constantly stretch to reach new plateaus and end up pioneering new styles because they never stop searching.

It is hard to discuss style without mentioning approach, since they both stem from the same core. Approach falls into two general categories: representative and interpretative.

Representative or "straight" photography is direct and illustrates the facts of a situation. Photojournalists strive to document humanity in an objective, honest, *representative* way. But that does not mean the journalist does not have a visual point of view. He must, because he has to exert control over subject selection, composition, and in choosing different techniques for execution.

The interpretive approach is often conceptual, dealing with ideas that are not represented in reality but suggested symbolically in an image. The image implies rather than states. Feelings, emotions and other visceral perceptions are conveyed, often provocatively. In order to offer insight into the essence of a subject, the photographer may alter the literal meaning in many ways: The interpretive image may be fantastic or imaginative, it may be an abstraction, or it may have a distorted perspective. The approach relies upon any number of techniques, including close-up, solarization, unusual shooting angles, etc.

Again, approach is dictated by the same considerations that affect style. There is no *one* way that's better than another. There is only what is right for you as an individual.

At the end of *The Complete Photographer*, Andreas Feininger writes, "A personal style cannot be forced. It must grow from within, an inevitable reflection of oneself." I heartily concur. And maybe I'll never have style, but I refuse to stop trying. ☐

other VOICES

MEETING A NEED

You have one very excellent photographic magazine—the type of magazine one expects but doesn't get when one picks up any of the other magazines.

I am 69 years old and retired, and turned to photography as a hobby because I dabbled in it years ago. I have taken a number of photos of people in senior citizens' meeting places. When I give these people a photo, they all have more than an ordinary interest. They ask questions about photography, etc. A number of them have come to me not knowing what to do with the time suddenly on their hands. I suggest photography, as it fits in with everything they wish to do and gives a lot of satisfaction.

A dozen ladies at one center are having the time of their life painting black-and-white scenics that I gave them with transparent paints. This hand-painting idea is right from the pages of your magazine.

I think you should have a section for senior citizens—perhaps a readers' gallery for amateurs 65 and over.

Thank you for a very good photo magazine.

Rev. Charles L. Burgie
Van Nuys, California

POCKET THIS SUGGESTION

Your magazine is fun to read as well as being informative, but it lacks articles on 110-format cameras. The only time you mention them is in "Product Proof Sheet" and "Spec Sheet."

In the January, 1979 issue you stated the purpose of the magazine is to "help others to take better photographs and gain more enjoyment from photography." A 35mm camera is not the only camera that takes photographs!

Joel Scott Shokes
Goose Creek, South Carolina

We wouldn't think of slighting 110 photography! The essential elements of subject matter, composition, design, darkroom techniques and exhibition are usually applicable to all of photography, including small-format, larger formats and motion pictures. We've devoted many pages to 110 in previous issues, and we're always open to new ideas on the subject from readers and contributors.—Ed.

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white papers



□ "...and when the day is through, I'll be looking at the moon but I'll be seeing you."

A professional photographic printer doesn't see much sunlight. I know. Some years ago, having already done a number of other things (some quite dumb), I thought it would be fun to be head printer in a small, quality lab. So when the opportunity came, I took it. I found myself in an occupation of solitude and quiet beauty, but also one of hard work, stress and sometimes considerable frustration. To earn one's livelihood at a craft can be very rewarding. Perhaps it has to do with using both the hands and the mind; I've long thought the combination to be healthier than the parts. Photography can be admirable in this respect.

For those of you who are contemplating spending months or years in someone else's darkroom printing someone else's negatives, I hope the verbal portrait that follows will be of use. Remember these are subjective impressions and that the experience will vary with the size of the lab, the services it provides, and the demands of its clientele. And to those who are now so engaged, I'll simply say that I have a special appreciation for you.

The instructions on the last processing envelope in the morning run say only, "1 8x10 #9A." No. 9A is a portrait of a little girl, and I see right through the glassine that this cutie's highlights are more blocked than Gregory Peck in *Spellbound*. It will take a little therapy to get any kind of print out of this negative. I position the strip of film in a glassless carrier, zap it with a short burst of compressed air and place it in the enlarger. Now I slip a target sheet into the 8x10 speed easel and hit the toggle switch on my motorized torture rack, a Beseler 45MCRX that I affectionately call "Electra-Glide In Blue." The lamphouse of the big 4x5 enlarger rushes upward with a familiar dental whirr that makes my molars ache.

In a moment I have the image composed and in focus on the target sheet, cropped conservatively to minimize apparent grain. I stop down the El-Nikkor lens to f/5.6 and study the image briefly before twirling the decade switches on the electronic timer. I'm not conscious of the numbers; it's all getting pretty subliminal by now. One thing becomes certain quite early: If you need to make test strips, you won't survive in most commercial labs. A good printer must be properly seasoned. After printing eight hours a day, five days a week for months, I think that if I never see

SILVER Dreams

JOE NOVAK

PRINTER'S DEVIL

a darkroom again, the coroner will still find traces of Ektaflo in my fingers and acetic acid in my lungs.

I brush the slide switch on the timer, extinguishing the lamp, and replace the target sheet with something more impressionable. Since the lighting was a bit flat and the negative overexposed, I select a relatively hard grade of paper. The primary exposure is followed by a long highlight "burn" to preserve for our dear customer some semblance of his sub-



This nifty little darkroom was designed and built by lab manager Rick Harper for Ferranti-Dege, Inc., of Cambridge, Massachusetts.

ject's lovely face. This I accomplish in the usual way—through my fist—by directing the light through a hole formed by my thumb and forefinger held just below the enlarger lens. After finishing with a modest edge burn for emphasis, I slip the sheet of paper into the tray of developer.

The safelight's amber moon shimmers in the murky Ektaflo and fills the room with its warm honey glow. For a moment I am conscious of the Gra-Lab timer, of the sound of its little synchronous motor and the phosphorescent sweep of metal blades. But in truth the clock is within me; I know how long it should take for the ghost to appear. And when it does, as it has thousands of times before, it is still a delight—a mystery that one enjoys without undue analysis, rather like seduction. As an old Everly Brothers song comes over the radio, I massage my ghost's freckles with developer.

Suddenly I wonder if Linnea has discovered the apple I hung in her film drying cabinet. Comrade Linnea,

as she likes to be known, spends her days reeling film, caging the reels and moving the cages through a series of thermostatically regulated chemical tanks with nitrogen-burp agitation. And when the laundry is done and the final rinse and soak operations complete, she hangs it all up to drip-dry in a cabinet that connects her place with mine. When she has a chance, she visits and helps me squeegee prints.

The thought of Linnea is distracting, to say the least, and when I come to my senses again the print is partially fixed and doesn't look half-bad. That's not good enough. This is too nice a kid to be shipped back to her father with lackluster highlights. Next to the tray of fixer is a small plastic cup containing a solution of potassium ferricyanide. The ferricyanide is mixed at the start of each working day simply by stirring a couple of pinches of the red powder into a few ounces of water. Proper working strength is determined by the color, which approximates a mild-mannered chicken soup. Some people have worked out the proportions scientifically; I've never gotten around to it.

I dip a cotton swab into the stuff and brush it into the child's hair to add a little separation and life. Just before the desired degree of localized bleaching is obtained, I return the print to the fixer to stop the action of the ferricyanide. I use the stuff to add sparkle to the eyes and teeth, and to accentuate highlights on the nose and cheekbones. The print now looks 100-percent better. The fixing operation completed, it is placed in the washer.

Why do I knock myself out to give the customers essentially more than they're paying for? The darkroom manager would like to know why. He loves my work, but he'd understandably prefer that I concentrated on volume. Sometimes I forget that this is a *business*. I want to use my skills to make people happy. But I do wish they'd give me better negatives to work with, and not so many pictures of babies and cats and architectural models! At times it was all downright depressing, almost like work.

Linnea bounces into my darkroom, as vivacious as the girl on the Morton salt cannister. "Why so glum?" she asks, playfully wiping the squeegee on my chest. She found the apple, and holds it out for me to take a bite. "If you'll make some more prints for me," she says, eyes twinkling. "I'll bake you another loaf of spice bread." She knows I'm hooked. I'll do almost anything for spice bread, even now. □

BLUEPRINT SERIES

How To Make a Fisheye Adapter

BY ALDO PANZIERI

PROJECT: To make a low-cost fisheye-type lens.

PURPOSE: To be able to make extreme wide-angle photographs with a normal 50mm lens on a 35mm single-lens reflex camera.

EQUIPMENT: 1. Metal screw-in lens cap for your 50mm lens; 2. viewing lens (Edmund catalog No. 42,169, \$8.95 from Edmund Scientific Company, 1981 Edscorp Building, Barrington, New Jersey 08007); 3. glue or epoxy; 4. electric drill; 5. small file or keyhole saw; 6. flat-black model-airplane paint; 7. small paintbrush.

PROCEDURE: First, make a 1½-inch hole in the exact center of the lens cap. This can be done on a lathe at your local machine shop, or you can do it yourself by drilling a circle of small holes with an electric drill and then cutting through the metal between the holes with a small precision file or a keyhole saw. Sand the edge of the hole smooth. Your lens cap will then look like the one in photo No. 4.

Next, remove the protective cap from the viewing lens (see photo No. 5) and unscrew the viewing lens element from the viewing lens baseplate. Insert the viewing lens baseplate into the hole in the lens cap and apply metal/plastic glue or epoxy to the edge of the hole in the lens cap and to the inside edge of the baseplate (see photo No. 6). Push the parts together and let the glue dry.

Paint the plastic baseplate with flat-black model-airplane paint to prevent light reflections between the viewer's rear element and the front of the camera lens. Paint the inside surface, but do not paint the threads. Paint the plastic around the rear element of the viewing lens, taking care not to mar the glass surface of the viewing lens. Dry the



1. Low-cost fisheye adapter lens converts your 50mm lens into fisheye with a 175° angle of view.

lens separately from the baseplate. When the paint on the rear of the viewing lens is dry, paint around the front element, again being careful not to mar the glass surface. Dry the paint, then screw the viewing lens element into the baseplate.

GENERAL DISCUSSION: You now have a fisheye adapter for your 50mm lens. Some 50mm lenses have front elements that are recessed, while others have front elements that are not recessed. Carefully check the fit of the fisheye adapter to make sure the baseplate does not touch your 50mm lens' front element. If it does, you will have to get an adapter ring to place between your lens and the fisheye adapter. (If the viewing lens of the fisheye adapter is screwed all the way in, it may touch the front element of the 50mm lens. This problem can be solved by unscrewing the viewing lens until its rear element is flush with the viewing

lens baseplate.)

Focus in the usual manner, i.e., by viewing through the viewfinder while turning the 50mm lens' focusing ring. You'll find that you can't use the infinity setting on the 50mm lens' focusing scale. Faraway objects will be in focus with the lens' focusing ring set much closer than infinity; somewhere between two and four feet generally seems to be the setting on the focusing ring when distant images appear sharp. For closer objects, just turn the lens' focusing ring to a closer setting until the subjects appear sharp.

For best results, use apertures in the f/11-f/16 range. Larger apertures will degrade the image. If you use a through-the-lens meter, take the reading before attaching the fisheye adapter. It might be wise to bracket exposures the first few times you use the fisheye adapter, just to see how your camera system reacts. □



2. Fisheye adapter consists of an Edmund Scientific Co. door security viewing lens attached to a lens cap that screws into your 50mm lens.



3. You need the Edmund viewing lens, screw-in metal lens cap, flat-black model-airplane paint, glue and paint brush to make the fisheye adapter.



4. Before and after: A 1½-inch hole is drilled in the center of the metal screw-in lens cap.



5. Remove protective cap from viewing lens.



6. Apply glue to hole in lens cap and to inside edge of viewing-lens baseplate.



7. After viewing-lens baseplate and lens cap have been glued together, paint rear and inside surfaces of baseplate with flat-black paint (but don't paint threads).

A NEW GENERATION



When we promised a "New Generation" of photography with the introduction of the AE-1 in 1976, you could only guess at the spectacular world of electronic SLR photography to come. You could guess. But we knew.

Now there's the Canon "A" System of photography. A group

of cameras and accessories offering the most advanced, reliable and cost efficient performance available in photography today. With almost all major components of the system interchangeable

among the three cameras. And with all three cameras using the forty Canon FD lenses and hundreds of Canon SLR accessories that have justly earned their reputation for excellence.

The scope of the Canon "A" System is unbelievably dynamic, unmistakably superior. It's for whatever kind of photography you are doing now or plan to do in the future. And it deserves a long and careful look.



Dalstack A

FD Lens



Power Winder A



Motor Drive MA



Battery Pack MA



NiCd Pack MA

USING THE A-1



The new Canon A-1 is more than just the most advanced single-lens reflex camera in history. More than a technological curiosity. It's a system approach within a single camera. An unmatched vehicle for the solution of the most complex

photographic problems with a truly remarkable simplicity in almost any case. And the heart of the A-1 is its six-mode exposure flexibility. That puts an end forever to arguments about which exposure mode is best in an automatic SLR by simply giving you everything.



Aperture priority shows pre-set aperture.

Shutter Priority shows pre-set speed.

Shutter-priority automation lets you select the speed you want to freeze action, prevent camera motion or purposely blur for dramatic impact. The A-1 selects the proper aperture in milliseconds.

Aperture-priority automation gives you total control over depth-of-field or lets you pick the aperture you prefer best. The A-1's shutter adjusts steplessly to give perfect exposure in any light.

3 Programmed automation is the A-1's unique all-purpose automation mode. It's great for shooting from the hip, adjusting aperture and shutter *both* over the camera's entire sensitivity range. And in an unmanned application it will continue to give correct exposures even when the lens' maximum aperture has been reached by adjusting for the correct shutter speed.

4 Stopped-down aperture priority makes the A-1 a *truly* universal camera, giving aperture-priority automatic exposures with anything you can mount on the camera—telescopes, microscopes, pre-set lenses, bellows and extension tubes. Anything.

5 Flash automation with the A-1 is absolutely the simplest anywhere. With either the Speedlite 199A or 155A all you do is mount the unit and turn it on. When the ready light is on (shown in the viewfinder) your aperture *and* shutter speed are automatically correct. If you shoot before the flash recycles, the A-1 reverts to regular auto exposure.



6 Manual exposure is just what the name implies. You set aperture and shutter speed for studio flash, special jobs or unusual applications—if there are any you can find that the first five exposure modes won't cover.

But the A-1's spectacular exposure control is only the beginning. Inside, all information is handled in

Six-mode exposure control.
System versatility.
Newer electronics for wider applications.



THE OFFICIAL
35MM CAMERA OF
THE 1980 OLYMPIC
WINTER GAMES

Canon A-1

digital form. Which means it handles a greater amount of information (that's why it has such exposure capability) as well as giving you a totally digital LED readout in the finder. A readout that's invisible until you turn it on and can even be shut off—while still letting the A-1 operate automatically. A readout that gives you a 7-LED display and tells you everything the A-1's doing. Changing every 1/2-second as the light changes. And varying in illumination intensity as the light varies. There's never been anything like it.

There's never been a camera that's handled like the A-1, either. All exposure functions can be controlled by the single AT dial, which locks to prevent errors. Different exposure modes are shown by symbol and color code, and only the appropriate scales are visible in each mode.

Exposure can be corrected as much as ± 2 stops in 1/3 stop increments and an exposure lock helps with really difficult lighting situations.

There's also a two-speed self timer, easy multiple exposures and a host of other control features that are a pure delight to use. With the new Motor Drive MA's smoothness and versatility (up to 5fps with Battery Pack MA) the A-1 is ready to handle any photographic challenge.

Whether you want to use the A-1 as a focus and shoot automatic SLR or explore the technological miracles it can perform, one thing is certain. You won't find anything like it anywhere for a long, long time.

USING THE AE-1



This is the one that started it all. A veritable flood of imitators. Yet the performance and cost efficiency that has made the AE-1 the *number one selling camera of its type* in

the world are still at work helping make it the most sought-after camera anywhere.

In your hands the AE-1 is a compact marvel of thoughtful engineering with the security and ease of shutter-priority automation. Most photographers agree that this type of automation is best for most photographers under most situations. The reason we could put it into the AE-1 comes down to foresight on the part of our FD lens designers. When you have the right lens mount, you don't have to build aperture-priority automation into your cameras. But that's another story.

The AE-1 is a model of direct, uncluttered photographic operation. Shutter speeds fall under your right index finger and apertures selected are clearly visible in the bright, easy-to-focus viewfinder. You can preview your exposure either with the shutter button or a special switch that falls under your left thumb. Just above this switch is a +1.5 stop exposure correction button that's just perfect for typical backlit situations.



Used with either the Speedlite 155A or new 199A, the AE-1 is *the* most automatic flash SLR ever. When the units' ready lights are on, your shutter speed is set to 1/60 sec. (no matter *what* the dial is actually set on) and your *aperture* is automatically set to the proper exposure for the distance range selected. All you do is mount the unit, switch it on and you're ready for perfect flash

The first computerized,
shutter-priority automatic SLR.
The last word in value.



 THE OFFICIAL
35MM CAMERA OF
THE 1980 OLYMPIC
WINTER GAMES

Canon AE-1

exposures. And if you shoot before the ready light is on, the AE-1 will make a correctly exposed image in the normal auto exposure mode.

The AE-1's automatic operation is enhanced even further by the operation of the optional Power Winder A—a simple auto winder that can shoot single frames or sequences as fast as 2fps at speeds above 1/60 sec. The reason that the Power Winder is so simple—read reliable—is that most of the brains for its operation are in the electronics of the camera.

If compact, automatic, state-of-the-art electronic performance at an almost incredible price is what you're looking for, you'll find it in the AE-1.

USING THE AT-1



If you remember when through-the-lens metering shook the photographic world, you'll love the AT-1. It's the classic through-the-lens match-needle metering camera with a twist. Because it shares the technology of the "A" Series of Canon SLR's, it has up-to-the-minute performance features that bring this traditional photographic format into the present with a bang.

In use it's almost as simple as the AE-1, with a bright viewfinder and fast, accurate needle centering. And it shares the "A" Series' compactness, great handling and light weight. But what's really exciting about the AT-1 is its access to the great "A" Series of Canon accessories.

With the AT-1 you get to use the Power Winder A for singles or sequences and both Canon Speedlites, the 155A and 199A. On the AT-1, they set the speed automatically, you set the aperture. And the Databack A gives you date/data recording at the press of the shutter, interchanging with the camera back with a simple press of a button.



If match-needle metering is the way you like your photography—but you don't want to sacrifice modern performance—the AT-1 is just what you need.

THE WHOLE PICTURE

Of course, the Canon "A" System is part of something a lot bigger—the whole Canon system of SLR photography. In it you'll find



forty of the world's finest lenses. Everything from Fish Eye to Super Telephoto. And everything in-between. Lenses that have set standards for sharpness, contrast and freedom from aberrations. As well as ruggedness and innovation. Plus a line of accessories for almost every conceivable photographic job under almost any kind of conditions.

Whatever you're planning to do in photography, whatever you've done, you'll see things differently through the Canon "A" System of cameras and accessories. It's truly a New Generation of photographic performance. See it soon at your local camera specialty dealer's.

Match-needle metering with
electronic flexibility.
Conventional photography redefined.



THE OFFICIAL
35MM CAMERA OF
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WINTER GAMES

Canon AT-1

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ALL ABOUT AUTOMATION

HOW TO MAKE IT WORK FOR YOU

BY PEGGY SEALFON

With runaway automation in the photo industry, equipment has become super-sophisticated. Cameras do practically everything but brew coffee. Auto winders make thumbs atrophy from lack of use. Zoom lenses optically follow the action while the body behind them remains riveted to a single spot. We're living in the space age of electronics, and moving parts are becoming restricted to human joints. Technology is changing the way we take pictures (and, subsequently, may alter our vision).

The obvious benefit for us picture takers of the world is the gaggle of choices and affordable prices. New models stream off production lines before older ones have accumulated dust on dealers' shelves. The array is inspiring; it's also brain-boggling. Too much automation is intimidating. Pity the uninitiated on their way to buy their first single-lens reflex. Buying new equipment today means getting automation—for better or for worse.

Otto Decker of Yashica (makers of Contax) thinks it's for better: "The more automatic you get, the less chance you have for error." But James Chung of Fuji Photo Film asserts, "Too much automation makes people lazy and destroys innovation." While the debate continues, one thing is uncontested: Automation is here to stay.

To help encourage the transition to autoelectronics, I've taken a hard look at some of the latest features of today's 35mm cameras and lenses. I've examined both advantages and disadvantages from a very subjective point of view—mine! Not an active pro, I'm an avid user who enjoys taking lots of pictures. I've tried to present seat-of-the-pants suggestions for getting the most out of newer modes and models.

CAMERAS

The most evident result of modern technology is the trend toward compact camera bodies. Most 35mm manufacturers are able to produce smaller, lighter-weight machines, evidenced by

(among many others) Minolta's XG-7, the Olympus OM-2, the Pentax ME and a slew of rangefinders. But small size does not represent fewer goods. These compacts are equipped with many of the same fancy features as larger 35mms. Reduced size has evolved thanks to tiny electronic components.

Still, skepticism is high on the scale of consumers' reactions. Has camera ruggedness been sacrificed for compactness? No, say camera makers. Internal designs rely on newer plastics of tensile strengths comparable to formerly used metals.

Electronic mechanisms, however, are delicate and more fragile than innards of mechanical cameras. They do not take kindly to being dropped. So, stock up on sturdy camera straps to ward off unmentionable disasters, and handle with care, after all!

Personally I like a compact camera. The lighter the better. It's better for travel and everyday portability. It allows for steadier picture taking, too. I can handle longer lenses without the weight making my hands tremble. And I can handhold with longer exposures. Best of all, I can carry more equipment over my shoulder without turning into a leaning tower.

Automatic exposure (AE)

It's becoming harder and harder these days to find a camera without some kind of exposure automation. The Canon AE-1 and Konica T-4 have shutter priority; the Fujica AZ-1 and Nikon FE have aperture priority. Some cameras, like the Minolta XD-11, have both aperture *and* shutter priority. And Canon's A-1 has both aperture and shutter priority *and* also features programmed priority. Confused, folks? You betcha!

OK. *Shutter priority* allows you to select shutter speed, then the camera electronically dials in the lens aperture (f-stop)—according to the light—for proper exposure. *Aperture priority* is the reverse. It lets you choose aperture (f-stop) and automatically sets shutter speed for correct exposure. *Pro-*

AUTOMATION

grammed priority sets both. You merely focus and shoot, leaving exposure entirely up to the camera, which chooses aperture and shutter in the "optimum" combination (hopefully).

Before you can take full advantage of any system, you've got to know the basics. Any AE mode can give you well-exposed photographs, but not necessarily images you want. It is vital to understand aperture/shutter combinations and how each affects the end product—the picture.

Let's consider the steps in using a conventional, non-autoexposure camera. You're outdoors on a sunny day photographing a group of kids at a birthday party eating ice cream at a long picnic table. You're using a manual camera with 55mm lens, loaded with ASA 25 film. You use the through-the-lens light meter. With settings at 1/500 at f/4, it's perfect. The needles are matched (or centered) and you're ready. You focus on the birthday boy at the far end of the table and shoot. But you're horrified when you see the pictures. The exposure is OK, but—good grief!—all the children seated at the near end of the table are out of focus. Why?

You forgot the basics. If you'd remembered, you would have taken into account depth of field. A smaller f-stop, say f/11, would have increased depth of field, and a slower shutter speed, in this case 1/60, would still have provided proper exposure. Both settings (1/500 at f/4 and 1/60 at f/11) would provide good exposure, but only one gives a good picture of all the party kids—in focus.

Similar considerations have to be made when using an AE camera. Obviously, you wouldn't waste time matching needles, but you'd still check exposure. If using a shutter-priority mode and your selected shutter is 1/500, you'd see that the f-stop was going to be pretty wide open.

Fortunately, all AE cameras show in the viewfinder what is being automatically set. So take a moment to note the LED or needle signal flashing inside the viewer. If it's at f/4 and you want more depth of field, change to a slower shutter speed to get a smaller aperture.

Learn the basics before leaping into super-automated equipment. As one technical representative for Braun North America commented, "Before you can learn to run, you have to learn

to walk." BNA is sympathetic to the beginner who wants to learn manual controls. In fact, they produce a line of Ricoh cameras claiming "up-to-date technology inside with simplicity outside" just for first-time SLR owners.

Of course, many AE cameras also offer a "manual" setting. But I don't know too many beginners who aren't tempted to use automation if they have it, in spite of wanting to learn the basics of camera use.

Once you've got your shutters and apertures in order, how do you decide which mode is better? That depends. What kind of pictures do you take? Have you used any kind of autoexposure before?

In general, if you've already used one mode, switching to another will temporarily hinder your picture taking. You'll experience a period of adjustment while realigning your thinking to function with the different mode. If you're not used to any, then choose according to the kind of shooting you do most.

Sports enthusiasts might find shutter priority attractive. They prefer having direct control over setting fast, stop-action shutter speeds or slow, blur-motion ones. Aperture-priority advocates are happier with more control over depth of field. But you may favor aperture priority for another reason. You may want to get the highest shutter speed possible.

One of the bonuses of electronic automation is the ability of the camera to provide unconventional settings. Using aperture priority at any given f-stop, autoexposure selects precision shutter speeds, which may fall between 1/60 and 1/125. But the highest acceptable speed is always chosen. Manually you have no in-between setting, but electronically anything is possible. You can get speeds of 1/80, 1/106 or 1/230. In the opposite mode, shutter priority allows electronically calculated aperture settings that might be in between f/8 and f/5.6, etc.

Choosing your mode is as individual as choosing a mate or a car. You've got to evaluate what features are important to you, what you're comfortable with, what feels right.

My taste prefers aperture priority. Since I've been using an aperture-priority camera, I'm used to it. But what works for me may not serve your needs. I like to stop down the lens so as not to worry about precise focus: Depth of field gives me leeway. My approach is fairly straightforward. On a typical wintry afternoon, I wandered

around taking pictures near Rockefeller Center. The day was overcast so I set an f/8 aperture to give me enough depth of field for general scenes. I would have preferred f/22, but I knew there just wasn't enough light to allow adequate shutter speeds. So I settled. I framed my composition, focused, and checked the bouncing needle in my viewfinder to observe the automatic shutter setting. Satisfied that it was fast enough to avoid camera shake, I took a shot. But if it hadn't been, I'd have opened up a stop or two. (Naturally some control over exposure is forfeited in limited-light situations.)

If I had been using a shutter-priority camera I still would have checked the viewfinder, but for the automatic f-stop setting instead. In any case, I want to be the master of my machine and take full charge.

For me, autoexposure is liberating. While many criticize that AE takes away an important ritual that enhances creativity, I find AE allows me even more creativity. I don't have to dwell on exposure decisions and am freed to concentrate on the subject, on finding the right angle, the best composition. I can dabble more in aesthetics, instead of getting overwhelmed by the technical calculations. AE is especially convenient for portraits. In the past, my subjects have had little patience with my fumbling over camera controls. With automation I spend less time dithering with dials and more time developing a rapport with my subjects. Plus if I'm shooting outdoors, I don't have to be concerned about a dark cloud suddenly sweeping overhead. I know the camera will compensate for the lowered light level. And it'll do it electronically, a lot faster than I could get the message from brain to hand. I don't have to interrupt my concentration.

Autoexposure has eased the technical complexities of calculating exposures. Just focus, press a button and get well-exposed pictures. Right? Wrong. The pitfall is to get carried away pressing the button and to forget about picture content. For this very reason, James Chung says, "Automation is both good and bad. The combination of automation with a thoughtful photographer, that's good!" I couldn't agree more. (Chung, by the way, has a list of credits to his name that reads like a photographic "Who's Who," including: president of the Photographic Manufacturers and Distributors Association, vice-president of the Society of Photographic Scientists and Engineers, and chairman of the Photo-



graphic Industry Education Advisory Council, in addition to his official position as director of Fuji Photo's Corporate Relations.)

AE can be habit-forming. An auto-snap-happy photographer runs the risk of slipping into lazy shooting patterns. Besides a blasé attitude about picture content—and what he wants to express—the auto robot forgets about exposure. "But the camera takes care of that!" you say? Like a computer, it's the human brain behind it that sets up the programs and makes it work. It's essential to pay close attention to the exposure information relayed in the viewfinder and to be ready to make adjustments.

In certain extreme-light situations, you have to compensate for bright reflections that fool an AE-controlled camera. In exposing snow, water or sky that occupies one-third or more of a frame, automatic cameras allow too little exposure for ground details. If you want those details, change to manual override and choose the necessary settings yourself. Some automatic cameras that lack manual operation have a multistop override feature instead. The Contax 137, for instance, has a four-stop exposure control.

Some cameras provide still another method for overcoming the problem—exposure locks. Chinon's CE-3 Memo-tron and the Konica T-4 are two that have "memory lock." If a subject is standing in front of a brightly reflecting lake, you'd move either of these cam-



ALL PHOTOS BY THE AUTHOR EXCEPT AS INDICATED.

1. Using an aperture-priority auto-exposure camera, I set the lens at $f/8$ for enough depth of field (with a 35mm lens) to capture a passer-by stopping to watch the ice skaters at Rockefeller Center and a clear backdrop of New York's buildings. I composed, focused and checked the auto shutter indication in my viewfinder to be sure I'd avoid image motion.

2. For the next frame, I changed the composition but not the f-stop. With AE, I was free to spend more time exploring new angles instead of worrying about exposure. I knew I had enough depth of field for what I wanted, and a quick glimpse of the electronic shutter indication told me I had adequate speed.

eras close to his face, depress the shutter halfway to activate the memory lock (which registers exposure), hold it there, return to position and release. The exposure would be exactly the reading taken close to his face. If unable to move close to the subject, cheat. Use your own hand's skin tones to lock in exposure. (Of course, to produce proper exposure, you should open up one stop from the reading taken from skin in either case, because Caucasian skin reflects about a stop

more light than the medium gray tone for which meters are calibrated.)

Some pros and advanced amateurs distrust electronic computerization altogether. They're especially petrified that when the battery goes dead they'll be left holding a nonfunctioning machine. A common-sense solution is to carry an extra set of batteries, which is only about as inconvenient as carrying film!

Another common-sense suggestion is to shoot a great many pictures to get accustomed to the way your camera reads situations. Meters vary from camera to camera. You might prefer more or less exposure than indicated. When using color transparency film, I expose about one stop under the meter's reading to get deeper saturation. Your meter might require $1\frac{1}{2}$ stops to get what you want. Shoot several rolls at varying exposures to determine your preferences and establish your own exposure guide. Then, alter your film speed index appropriately. If you want slight underexposure and you're using ASA 25 color film, set the E.I. at 40 or 50. The autoexposure will work normally, but the film will get less exposure. Then, if you have extra time during a shooting, switch to manual anyway (or use your override) and bracket. A little insurance can't hurt!

If your meter should fail, you can always go back to "GO"! Pull out the film instruction sheet and follow the exposure recommendations.

Many pros *never* use a meter. If you shoot enough, you can probably attempt exposure guesswork. In fact, it wouldn't be a bad idea to find out just how dependent you are on your meter. Turn it off and shoot a roll solo. If you only get two or three acceptable shots, you "do not pass go and do not collect \$200." Go back to jail—imprisoned by meter dependency!

Autofocus

The world's first autofocus camera became available in November 1977. It was quite a breakthrough—the Konica C35AF. Since then, half a dozen others have surfaced with variations on a theme.

The theme is the Honeywell Visitroneic autofocus module, based on the principle of electronic contrast measurement with a metering field in the center of a bright-line viewfinder for rangefinder systems.

Once again electronics has triumphed. The lens is automatically focused with nary a muscle flex by the photographer.

The variations range from the Konica model, in which the subject is framed

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AUTOMATION

within a small centered rectangle, to Chinon's 35F-A, which adds an automatic "spot" focusing option and a moving needle to indicate focus scale and distance locked in. Then there's the Cosina AF, which offers two options: either auto or manual focus. Then, add a beam sensor for proper autofocus in the dark and a focus memory lock that retains focus at whatever position you choose, and you have the Fujica Flash camera.

There are still others. But the only autofocus system I've tried is Polaroid's SX-70 Sonar One-Step, which is an entirely different breed altogether. (Permit me a brief departure from discussing 35mm format.) The Sonar is based on a sound-wave measurement, which calculates the distance a sound—emitted from the camera—has to travel to reach the subject. The calculation is instantaneous, and the camera electronically sets the appropriate focus and exposure all in about one second. It's highly impressive. At an introductory function held at the home of one of Polaroid's PR directors, I scurried about with the unit feeling akin to Peter Sellers' taking "a shot in the dark." With a flash attached, I needed no light whatsoever for the autofocus to work perfectly, since it's all based on sound. It's fascinating. Of course I had little idea what I was snapping until the image surfaced on the instant print. I admit, I got carried away with the fun of it all. And I suspect *fun* is one of the largest attractions of autofocus!

For newcomers in the world of picture taking, autofocus is yet another step toward simplification. With its advent, however, I can't help but think we've come full circle, returning to Kodak's old saw: "You press the button and we do the rest." Still, for many who have difficulty focusing an SLR, the autofocus is a big asset for producing sharp pictures.

Motor drives/auto winders

Motor drives were once strictly for pros. The news photographer needed speedy coverage of a late-breaking event. The free-lancer, shooting in color, wanted half a roll of identical frames before the scene changed (for disseminating originals to several buyers simultaneously). The sports photographer machine-gunned frames while the spotlighted skier made his competition jump or the racer hurtled through the finish line. But today's proliferation

of drives and winders for popular-priced cameras makes it possible for anyone to have trigger-fast shooting.

I'm not much of a speed-shooting devotee, but there's no question about one major motor-drive benefit! Like auto exposure, it's liberating. When you take your eye away from the camera to advance film, you lose a precious instant of concentration. A motor drive—or auto winder—eliminates interruption and allows you to continuously watch—and photograph.

But, on the other hand, drives similarly trap you into not thinking. As James Chung says, "The photographer just doesn't have time to think." If you use a motor drive, don't let it control your eye. Carefully select the moment(s) you want. Use the motor drive for its advantages—instant readiness and speed of operation in special situations. Don't let its negative aspects encourage you to recklessly turn out negatives!

Personally, I prefer auto winders. A motor drive advances film at up to five frames per second, an auto winder at usually two or three fps. For the kind of shooting I do, I don't need speed. I need the security of knowing I'm always ready for the next shot. On too many occasions, I've set up a picture, composed meticulously, and squeezed the release only to be shattered by discovering I'd never advanced the film. Infuriating! With an auto winder I don't have to worry. A motor drive also relieves anxiety, but also adds extra ounces I don't need. I simply don't have to have all the sophisticated components of a motor drive.

Most motor advancers offer several speed settings. The Canon A-1's motor drive can be cycled at three speeds: high (up to five fps), low, or single frame. In contrast, Leica's R3-MOT motor winder provides two: continuous (up to two fps) or single-frame.

In general use, top-speed performance is governed by shutter speed, which must be fast enough to permit recycling. On Nikon's MD-11 motor drive, the maximum rate of 3.5 fps can be achieved only with speeds greater than 1/125.

Many drives/winders are integrally designed for one camera model. Chinon's Power Winder is integrated with their CE-3 Memotron camera. Minolta's Auto Winder D was made expressly for the Minolta XD-11. And so forth.

Interestingly, some manufacturers have stepped beyond integration and jumped into incorporation. A few recent cameras feature *built-in* auto

wind. The Contax 137 and Konica FS-1 cameras both provide auto wind as *standard* operation for film advance. In fact, both models are missing typical thumb advance levers.

REDESIGNS

As autoexposure and auto-wind features are being incorporated, we're witnessing the disappearance of more and more "normal" control knobs. Shutter dials are vanishing on aperture-priority cameras and film-wind levers are becoming extinct on auto-wind models. What's next?

The Konica FS-1 ("First System") created a stir by its nonexistent film-advance lever, but even more eyebrows were raised over its auto-load system. Pop in a film cassette with leader extended and close the camera back. The film is fed into a take-up spool and readied for the first picture. Miraculous! Camera designs are getting positively futuristic!

Super-compact rangefinders now incorporate such handy features as built-in flash and novelties such as built-in date-recording systems. And remarkable smaller formats—such as Minolta's 110-Zoom and Pentax's 110-size SLRs with interchangeable lenses—are suddenly flowing onto the scene.

James Chung says self-timers and shutter speeds of 1/1000 and 1/2000 are disappearing. Consumers are looking for different features, and, to reduce costs, manufacturers are bending to meet demands. "People prefer AE over a 1/2000 shutter speed. And how often do they use self-timers?"

Needless to say, the camera is changing. And as manufacturers vie for industry limelight, competition inspires innovation.

LENSES

In keeping with camera innovation, lenses also shine with spanking new elements (no pun intended). Ron Schmidt of Vivitar credits breakthroughs to computer-designed optics and electronics. And with a substantially expanding market, he admits that manufacturers—like Vivitar—justify investing more in research and development. Again, the beneficiary is the consumer.

Today's fixed-focal-length lenses are smaller, lighter and faster. You can easily carry more lenses without calling out the pack mule. Furthermore, lenses have higher resolution and, due to better coatings, provide richer color saturation. As if that were not enough,

3. Autowinders are great for photographing people, especially if they are as animated as Jean and Rose. You can be ready instantly to catch those quickly fleeting expressions.

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AUTOMATION

many now tout "macro" close-focusing capability.

There's variety to suit every visual need. Lenses range from fisheye (180° angle of view) to wide-angle, "normal," telephoto and super-telephoto, with practically all degrees in between.

Documentary and "street" photographers often use wide-angles as standard, favoring expanded views to include important environmental details. A portrait photographer relies on a moderate telephoto to focus attention precisely on the subject. Rarely would he choose a wide-angle—especially not a 35mm or wider—because of its tendency to distort facial features. The exception would be if he wanted that effect for a surreal, subjective or "artistic" portrait.

For the photographer who can't get close—or doesn't want to, like the fellow on African safari who spots a lion—long telephotos bring the beast into view (without inviting danger). Teles are also a boon for the sports shooter seated in distant spectator stands.

While teles have the capacity for sharp renderings, they are also trickier to focus. Few have depth-of-field guides, chiefly because they don't offer much depth of field. Teles compress space and demand absolute accuracy in focusing. Super-teles are especially difficult. I remember a wildlife photographer who used a 500mm lens to capture a magnificent image of an eagle. He focused on the right eye, and in the final image you could see that the left eye, perhaps a few centimeters further from the lens, was out of focus. Another pointer: Keep in mind atmospheric haze when using super-long teles. Subjects tend to turn blue.

As history repeats itself, so do photographic styles. The work of many early pictorialists was characterized by soft-focus romanticism. Contemporary photographers have been sticklers for pinpoint sharpness until rampant nostalgia surged and made the old-fashioned look desirable again. So for soft-focus nuts, lens makers have come out with variable-softness lenses, which focus from sharp to soft.

Digressing back to basics for a moment: Before launching a lens-buying spree, get to know *one* lens thoroughly first. Choose a "normal" 55mm, or wider 35mm, or whatever your heart craves. But stick with it. Use it for every kind of image making from landscapes to portraits. Owning a plethora

of lenses without knowing the purposes and potentials of each is self-defeating. (And that applies to all photographic tools.) You'd be pleasantly surprised at what can be done with only one lens.

I'm reminded of a success story of a young woman who started doing environmental portraiture. She'd ask to photograph famous authors and playwrights in their homes. When they agreed, she'd arrive with the only equipment she owned—a 35mm SLR and a 55mm lens. Her impressive portfolio—created with a single lens—established quite a reputation for her, culminating with an exhibition on Madison Avenue and publication in several magazines.

A beginner also needs to know limitations of handholding lenses, especially when using autoexposure. A shutter speed of 1/60 is fine if you're using a 55mm lens. But if you've got a 200mm hanging on the front of your camera, you'd better not use a slower speed than 1/250 if you don't want image motion. (Or use a tripod.)

Still, choosing a lens is hard to do, especially considering the enticing new zooms, which began flooding into camera stores only a couple of years ago.

Today's zooms are fine-tuned to offer variable focal lengths and focusing from infinity to close-up. Some experts contend they are virtually as good as older fixed-focal-length lenses. In fact, one prediction echoing through the industry is that zooms will obsolete fixed-focal-length lenses. Eventually two macro zooms will replace all others, so the rumor goes. There will be one to handle the 28-75mm range and another to cover 80-200mm. The potential is staggering, but I'm not so convinced that fixed-focal-length lenses will go the way of two-lane highways and nuclear families.

First, the good points of zooms. They are astonishingly versatile. They dispense with the need for cumbersome bellows or time-consuming extension tubes. They minimize carrying different lenses since several focal lengths are neatly tucked into one zoom. There are wide-angle zooms galore (e.g., Canon 24-35mm, Fujinon-Z 29-47mm, Zuiko 35-70mm); a variety of middle-distance zooms (e.g., Minolta 50-135mm, Sigma 39-80mm and 80-200mm, Tamron 70-150mm, Vivitar 90-180mm). And longer-range zooms are exemplified by Soligor's 100-300mm. Some can be focused very close. Soligor's 100-300mm has zoom focusing to 16 inches, and the Soligor 75-205mm zoom focuses to five inches.



4-7. Zoom lenses afford a tremendous variety of picture possibilities. All these images were taken with one 100-200mm zoom lens. Note the varied focal distances and the many special effects. Photo No. 4 was taken at the longest 200mm focal setting; No. 5 was taken at 100mm. For No. 6, I changed the angle and worked with a slower shutter to get slight camera movement for a softer effect. No. 7 shows zoom-motion effects obtained by using a slow shutter and smoothly, steadily zooming while making the exposure.

Obviously, there's plenty of variation. Each lens maker generally produces an assortment of companion lenses to fit his camera systems. But several, such as Sigma, Soligor, Tamron and Vivitar, make lens mounts to fit a variety of cameras.

Zooms decrease the time needed to change focal lengths. A quick twisting or sliding of a collar brings in another focal length. With a flick of the wrist,

you can explore different compositions and edit scenes quickly—a very nice feature if you want instant visualization without changing lenses! And unique effects are possible. By using a slow shutter and zooming in or out while gently squeezing the release, you can achieve a zoom-motion effect—a burst of blurred image-repetition that makes for dramatic images.

Now for the other side of the optical coin—the disadvantages. Zooms are heavier and clumsier to handle. Inexperienced users have a tough time getting used to rotating collars and adjusting focus. Fortunately, ultranew zooms maintain focus even while zooming.

Nevertheless, a zoom takes practice getting used to. I recommend lots of trial runs with an unloaded camera.

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AUTOMATION

Keep rotating the zoom until the movement is effortless. Develop a rhythm of zooming. Don't get fancy until you've mastered regular operation. Unless you use a zoom with continuous-focus capability, focus is best accomplished at the longest focal length. Then you can zoom to shorter distances without having to refocus. Remember too that a heavier zoom will require greater steadying, as well as higher shutter speeds.

Some available-light situations simply prohibit use of zooms. While a 50mm f/1.4 lens can be combined with fast ASA 400 film to allow picture taking in very low light, a zoom's widest aperture is typically f/3.5 or f/4. So don't trade in those valuable fixed-focus, fast lenses just yet.

The final drawback is financial. Zooms are expensive. Vivitar's 100-200mm, at the low end of the price scale, retails for \$329.50; the Vivitar Series I 90-180mm is \$665; and Leitz' Vario Elmar 75-200mm rings an all-time high at \$1,509. Zooms are one way to cure the muscle/nerve disorder called "ponderous-wallet disease"! However, the price of a zoom pales next to the cost of three or four lenses. You are getting significant savings and a lot of built-in versatility to boot.

I've worked out my own modest lens-choice system. Since I'm happiest when not overly concerned about critical focus, I have a propensity to use wide-angle lenses over telephotos. I keep a 35mm lens on my camera as standard. It's light and easy to handle and gives me a viewpoint I like. For occasions when I think I'll want some tele capability, I'll carry along either a 75-150mm zoom or 100-200mm. That way, I'm still not overloaded with equipment, but I have enough flexibility for any situation that might arise. If I'm on assignment, I'll usually lug along an extra camera body fitted with one of the zooms and then carry an extra 28mm lens to give me enough variety. I streamline equipment to a minimum. The less I carry, the better my back feels.

But again, what works for me may not satisfy you. Sometimes it helps to try a few lenses. If you can beg or borrow different lenses, shoot a roll or two just to get an idea of what each does in terms of altering space and perspective. Each provides a distinct view. You'll discover a viewpoint that suits your picture preference, and



8. A square-inch microcomputer chip is an example of one of the revolutionary electronic components that make the new photo machines go 'round (and reduce equipment size). The one pictured here is the key to Chinon's new Power Winder and contains a remarkable 1200 transistors.

that'll be the lens(es) to purchase. If you can't beg or borrow, a more practical procedure is to view lots of photographs and develop a sensitivity to variations from wide-angle to telephoto images. After a time, you'll immediately recognize the differences, and you can begin to carve out your own taste in terms of the photographs you want to create.

Electronic computerization and the changes it has brought are mind-expanding. But they take some adapting to. When electronics first infiltrated camera design, I for one was aghast! I cringed at the idea of using some super-duper autoelectronic machine in place of my familiar camera. What a dichotomy! There I was, daring to drive a motorcycle around New York's potholed streets, but terrified to try a new still camera. I think I feared compromising my photography with automa-

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tion. I bucked the tide, clinging to my old manual.

Then it happened. I tried an autoexposure Nikon FE camera and did I get hooked! Compromise! I've actually been more inclined to experiment, explore and indulge in self-expression. And if I can be an impartial judge, I think my photography has improved.

Clearly the future holds in store a photo-potpourri of newfangled equipment. The crystal ball reveals visions of more electronics and, possibly, complex new systems requiring total camera and lens revamping. The gadget-conscious picture taker is sure to thrive in the 1980's. And for those of us less caught up in gizmo-mania, we'll learn to adapt. No need to panic. We'll just invest some time to sort out those features we feel can enhance our own picture taking.

One conclusion is evident. Photography continues to be a challenging and exciting medium. As tools become more sophisticated, so too will our photographic vision continue to discover new horizons. □

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The winder will advance the film one frame at a time or continuously at two frames per second. It stops automatically at the end of the film. An LED flashes to show when the winder is operating and glows steadily when the roll is completed.

Multi-mode operation for unprecedented creative freedom.

In aperture-priority mode, you set the lens opening and the XD-11 sets the shutter speed automatically. This lets you control depth-of-field and use close-up equipment and mirror lenses automatically. Shutter-priority mode lets you control shutter speed while the XD-11 sets the aperture automatically. For creative control in either automatic mode, you can modify exposure up to ± 2 EV. Or you can set both shutter and aperture yourself in the metered-manual mode.



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An electronic flash that automatically synchronizes with an auto winder.

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Aperture-priority mode



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2



3



4

PROCESSING

E-6

AT HOME

IT'S AS EASY AS BLACK-AND-WHITE

BY BILL HURTER

BIG PROBLEM: Not too long ago, I was shooting an assignment for the magazine on a very tight deadline. I had chosen Kodak Ektachrome Film because I knew I could get one-day processing from the lab, and that's what the assignment called for—a finished job on the art director's desk at 10:00 the next morning. No problem—except that I didn't finish shooting that day until 3:30, three hours late for one-day processing. Cringe.

INTROSPECTION: I then did what any self-respecting, God-fearing photographer would do—panic. While sweating profusely and after momentarily contemplating a career in plumbing, I dialed a couple of sinister-looking "overnight" labs from the *Yellow Pages*. No luck. More panic, and then a glimmer of hope—I'd see an expert.

1. Sunset over Santa Barbara, California was on the first roll of Kodak Ektachrome 200 Film I ever processed at home. I was off on the developer by 2°F but it didn't seem to hurt. Sun was exposed through red filter in 1000mm f/11 Nikkor lens.

2. Child's ladder photographed ten minutes before sunset on Kodak Ektachrome 64 Film shows accurately the color of the light.

3. The interior elevators of the San Francisco Hyatt Regency Hotel were photographed with Ektachrome 200 (daylight) pushed two f-stops. E.I. 800 speed is responsible for short shutter speed that stops movement of indoor elevators. Tungsten lighting causes warm-tone shift.

4. Yosemite Falls in Yosemite National Park was photographed one hour after sunset in near-total darkness with Kodak Ektachrome 400 Film pushed three f-stops to E.I. 1600. Scene is monochromatic because of extreme lack of direct light. Eight-second exposure caused water to blur.

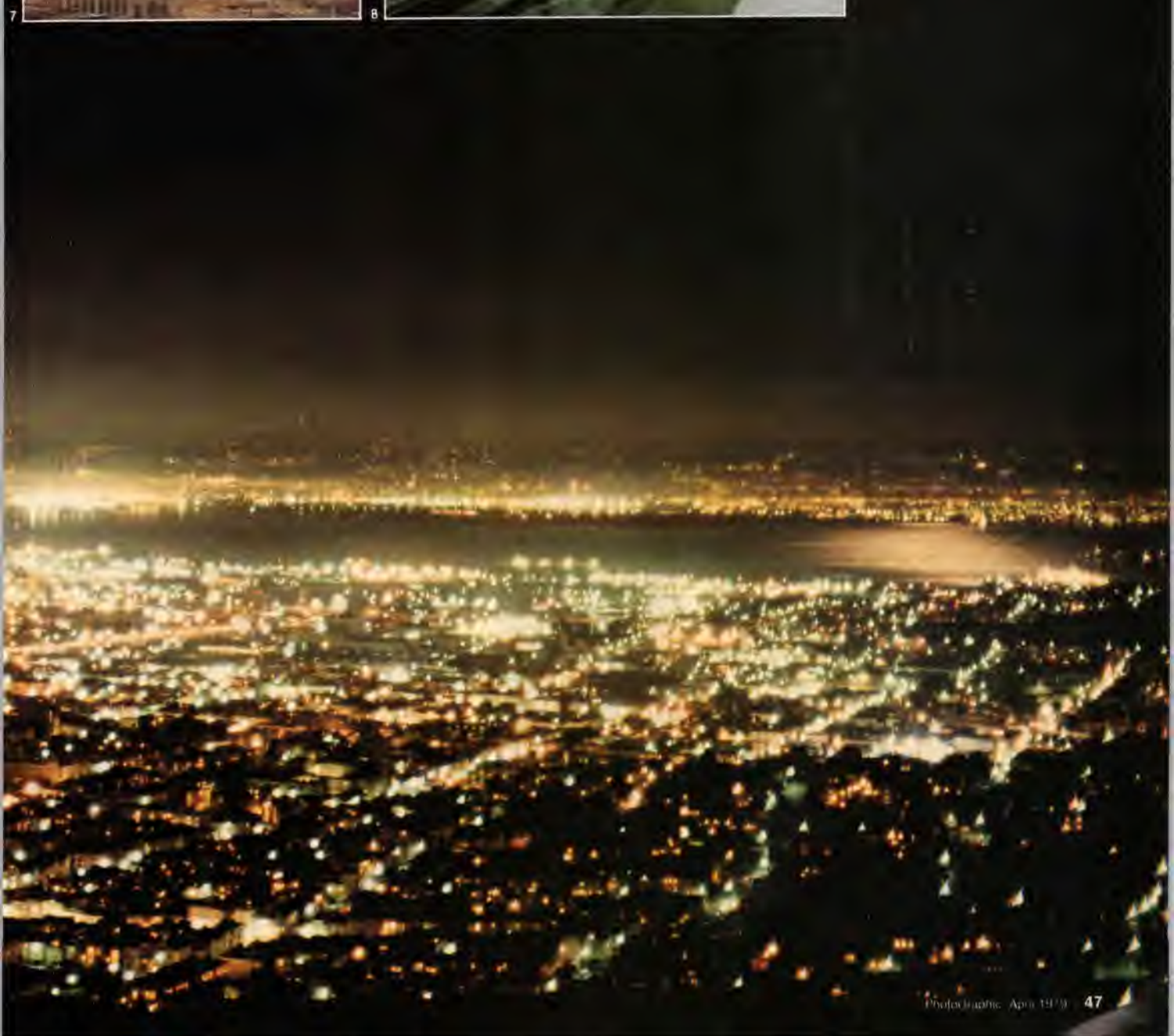
SOLUTION: I drove through the dimming light of late afternoon to my favorite camera store. "Manny, you've got to help me," I gasped. "I've got these eight rolls of film and I've got to get them souped right away."

"Relax, son," Manny said reassuringly, "I can help."

Manny's solution, as you can probably tell from the title of this article, was to process the film *at home, myself*. I was a little skeptical at first, never having processed transparencies at home before, but after a few more of Manny's reassurances, and after glancing over the instruction booklet in the Unicolor E-6 Chemistry kit, I decided to give it a whirl. Although there were other E-6 home processing kits to choose from, namely Kodak's and Besseler's, I chose the Unicolor because I had already converted my home black-and-white developing setup from inversion-type tanks to Unicolor motorized Uniroller and Filmdrum in the interest of speed and consistency (not to mention that I've always hated developer dribbling up my sleeve every time I inverted the tank to agitate).

To make a long story short, I went home, read the instructions, and then went to work. After a few short hours my film was perfectly processed and drying in the shower adjacent to my darkroom. In the morning I cut and mounted the good slides and still had





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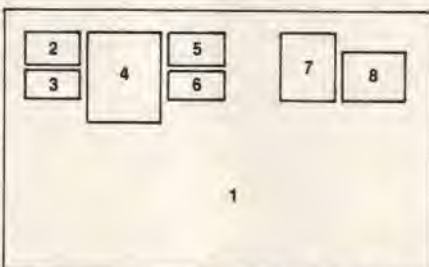
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PROCESSING E-6

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Perhaps you're saying to yourself, "Well, shoot, I'm never on a deadline, why do I want to switch from my lab?" There are a lot of reasons. Processing E-6 at home is fast, cheap, provides you with great control, gives consistent results when you follow the directions, allows for unlimited creativity by virtue of the many different film speeds you can attain, and it's convenient—you are processing color film right at home! But I have left out the most important asset of home-processing your Ektachrome: It is one heck of a lot of fun. The ghoulish tales of the difficulties of color film processing just simply don't apply to the Unicolor E-6 kit. It is as straightforward and easy to do as riding a bike. And since all the different E-6 Ektachromes are processed for the same times, anyone who has ever developed black-and-white film successfully should have no trouble with E-6.



ALL PHOTOS BY THE AUTHOR.

1. San Francisco skyline at night was recorded with Ektachrome 200 pushed to E.I. 800. Because contrast is increased, the different-colored street lights have become exaggerated.

2. A winery in Napa Valley, California was photographed with Ektachrome 64 film exposed normally. Notice crispness and purity of color in the shadows. Perfect color is possible when you process your own slides at home.

3. San Francisco skyline photographed at mid-day. Contrasty lighting and obvious increase in contrast from push-processing Ektachrome 400 three f-stops gives the photo a litho effect and enlarged grain. Notice the color rendition is slightly abnormal.

4. Ektachrome 64 was used to photograph this rainstorm over the Pacific Ocean from the air. Note the subtlety of color changes brought about by sensitivity of E-6 film, good exposure and accurate processing.

5, 6. Comparison shows same hibiscus flower photographed at same time of day. In photo No. 5 Ektachrome 200 was pushed four stops to E.I. 3200, providing a surreal effect. In photo No. 6 Ektachrome 400 was pushed three f-stops to E.I. 3200. Notice more natural color rendition and appearance in slide pushed three stops.

7. South San Francisco scenic is example of high-key processing. Shot was exposed on Ektachrome 400, underexposed one stop and then processed as if it were being pushed four stops. See text for more details.

8. Subway train was "pull-processed" to decrease contrast and increase color saturation. Ektachrome 64 film was exposed at E.I. 32 and developed for 4½ minutes instead of 6½ minutes in the first developer. For more information on this technique see text.

All photos made with Nikon F2 AS camera and 35mm, 100mm macro, 50-300mm zoom and 1000mm Nikkor lenses.

EQUIPMENT

Most of what you need to process your E-6 transparencies at home you probably already have, with the exception of the Uniroller and film drum. Although this discussion will center around motorized film processing, if you don't own a motor-base agitator but have regular inversion-type developing tanks, you're still in luck because it is virtually the same procedure with only minor differences. I happen to like the motorized mode because it frees me to do other things like cleaning up or preparing for the next step in the process; or, in the case of long first development times that occur with push-processing, I can just put the film drum on the agitator and go out and make myself a sandwich.

One item that's basic to precise color processing is an accurate thermometer. Unicolor recommends you compare your darkroom thermometer with a household thermometer to compare for accuracy. Many a batch of color film has been ruined by first or color developers that were too hot or cold.

You will also need an accurate darkroom timer with a sweep second hand. You could use your wristwatch if it's so equipped, but it is easy to get confused unless your watch is capable of timing separate intervals.

You will need seven 16-ounce storage bottles with labels. You can use plastic ones, like Camrex/tainers (shown in photo No. 3, page 51), or you can use ordinary dark brown glass bottles that you can obtain from your local drugstore. Glass seems to conduct heat and cold a little faster than the plastic, but other than that there is very little difference between the two. You will also need a tray or pot big enough to hold the bottles. This will serve as a water jacket (not related to raincoats) for maintaining proper temperature. Rounding out the list are a couple of 16-ounce graduates or four eight-ounce graduates (also known as undergraduates) and a funnel. Oh, and of course, the E-6 chemistry—in my case, Unicolor.

As you can see, you don't have to run out and buy a lot of sophisticated gear to home-process your own slides. Most of what is used is found in the average darkroom.

MIXING UP A BATCH

Once you've mixed up your first batch of E-6 chemistry, you will see there was nothing to be afraid of. Color chemistry isn't particularly exotic, complicated or dangerous unless you shower with the stuff. And if it takes

you more than 20 minutes to mix the all-liquid concentrates, you are probably doing something wrong.

There are two important things to remember when mixing chemistry: Mix individual solutions in the order in which they are used, thus familiarizing yourself with the order of things; and always clean the graduates and funnel between solutions. Chemical contamination will take the fun right out of your first encounter with color film processing. When a solution is mixed and poured into its storage bottle, label it with the name of the chemical and the date mixed. Later, after you've developed a few rolls, you can also record how many rolls have been run through the chemistry.

If you are going to process film immediately after mixing the chemistry, then mix the solutions at the proper temperature, 105°F (100°F if you are using inversion-type tanks). Otherwise, ordinary tap temperature is suitable.

THE BIG PLUNGE

Once the chemistry is mixed, you are ready to process your first rolls of color slide film—well, almost. First you must bring the chemicals to the proper temperature. To do this, first adjust your tap water to the proper setting (105°F, or 100°F). Then fill your water jacket with water and place the bottles in it. You have to keep bringing the water jacket back to temperature with repeated water changes as ambient room temperature works rapidly to lower the chemistry's 105°F reading.

A quick way to fine-tune the temperature just prior to using a solution is to have small buckets of very hot and very cold water on hand. Once you have your chemicals between 95°F and 105°F, your water jacket is doing its job. But now you have the difficult task of making the first developer, reversal bath and color developer hold precisely at 105°F. With the thermometer in the chemistry bottle (not the water bath), check the temperatures of all three; if too low or too high, fine-tune each in either the hot or cold bucket until it stabilizes, and then return it to the water jacket. Check again just prior to using each solution, and if it has gone up or down, fine-tune the temperature again.

Temperature control can be the most frustrating part of the process, as you are juggling minute differences in temperature among seven separate solutions. A way to beat the heat, so to speak, is with a temperature-control bath such as that made by Photo-Therm. Their Constant Temperature

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PROCESSING E-6

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After you've loaded the film onto reels and loaded it into the film drum (or tank) you are *really* ready to take the big plunge. Remember, load the film in total darkness; once the film's loaded, the rest of the process is done in normal room light. Line up the thermometer, water bath and chemicals, graduates and funnel, and bring the tap water to temperature.

Now, fill the film drum with 105°F water and let it stand for one minute. This is the water preheat step, which conditions both the film and the double-walled Uicolor film drum to hold the temperature throughout the process. If using conventional tanks, there is no preheat step. At the end of one minute, dump and fill the drum with the first developer. Your timer should be set for the prescribed 6½ minutes plus five seconds. The extra five seconds is lead time that allows you to start pouring precisely when the timer starts a 6½-minute interval.

Ten seconds before the 6½ minutes are up, start draining the first developer, either into its container, if it is to be reused, or down the drain. The next step is the water rinse, which means six full changes of water. The time is not as important as the amount of times water is exchanged. Again, water must be exactly 105°F. If you are using a conventional film tank, simply run the tank under 100°F rinse water for two to three minutes. Next is the reversal bath. Add the required volume, agitate on the Uniroller and drain ten seconds before the two-minute prescribed time elapses. Both reversal bath and color developer must be exactly 105°F per the instructions, but the temperatures thereafter display a much wider latitude.

This is a good time to issue a few precautions. Be sure you work in a well-ventilated area, as the fumes from the chemicals as well as the high relative humidity caused by the 105°F wash water will have you rocking and reeling in no time. Also, if you have a 30-gallon water heater or smaller, be sure not to deplete your hot water supply before you begin the process. If you have a large family, wait until the dishes are done or big sister (or girlfriend) is out of the shower. The constant drain on the hot water supply will cause your wash water temperature to

PROCESSING INSTRUCTIONS FOR UNICOLOR FILM DRUM

See Film Drum Instructions for solution volume required for the size and number of rolls being processed. Film must **NOT** be subjected to light until completion of Reversal Bath step.

STEP	SOLUTION	TIME	TEMPERATURE	REMARKS
1.	Water preheat	1 min.	105°F (40.6°C)	Fill Film Drum, let stand 1 min & drain at end of step.
2.	First Developer	6½ min.	105°F (40.6°C)	Add required volume, agitate on Uniroller for required time & drain. Include drain time in total time for this step.
3.	Water Rinse	2-3 min. (See remarks)	105°F (40.6°C)	FILL Film Drum with water & drain. Repeat 5 times. NOTE: total of 6 rinses is more important than absolute rinse time.
4.	Reversal Bath	2 min.	105°F (40.6°C)	Add required volume, agitate on Uniroller & drain at end of step.
5.	Color Developer	6 min.	105°F (40.6°C)	Same technique as reversal bath.
6.	Stop Bath	1 min.	90 - 110°F (32 - 43°C)	Same technique as reversal bath.
7.	Water Rinse	2 min.	90 - 110°F (32 - 43°C)	Use water flow sufficient to fill & dump Film Drum 6 times in 2 minutes.
8.	Bleach	3 min.	90 - 110°F (32 - 43°C)	Same technique as reversal bath.
9.	Fixer	2 min.	90 - 110°F (32 - 43°C)	Same technique as reversal bath.
10.	Water Rinse	2-3 min. (See remarks)	90 - 110°F (32 - 43°C)	Use water flow sufficient to change water in Film Drum at least 6 times. Time not critical.
11.	Stabilizer	½ min.	Ambient	Agitate gently initial 10-15 seconds only.
12.	Dry	—	Not over 140°F (60°C)	—

fluctuate, possibly at a critical time.

It is important to use the time between steps wisely, while the film is agitating. It is extremely important to prepare for the next step. For instance, while the film is in the reversal bath, wash the funnel you used to pour back the first developer and then pull the color developer from the water jacket and have it uncorked and ready to go. If you use the agitation time wisely, you won't get caught not knowing what to do next or pick up the wrong chemical. Be sure to have the Uicolor instructions posted close by so you can easily refer to them.

Continue through the process following the instructions carefully. They are self-explanatory and you will find them simple to follow. When you reach the stabilizer step, you will notice that the Uicolor instructions call for only ambient room temperature. If color film is

anything like black-and-white, a 30° temperature jump for one of the solutions would not be too beneficial. For that reason, I try and keep it in line with the other temperatures. Also, you will notice that if the stabilizer is mixed with distilled or deionized water, there will be less chance of debris drying on the film. The water supply in my area is filled with minerals, and as a result, I must use distilled water in the stabilizer to avoid spotting.

When you remove the film from the reel after stabilization, do not be alarmed. When the film is still wet, it is opalescent, meaning that it is both refracting and reflecting light in a play of colors. As the film dries, the milky appearance disappears.

The film can be dried in a heated film dryer or it can be air-dried. Either way, be sure it is in a dustproof environment. In my home darkroom, I usu-



1. You don't need much in the way of equipment to process your E-6 transparencies at home: just a reliable thermometer and timer, a graduate, the Uniroller, reels and film drum and the Unicolor E-6 chemistry. You'll need some slide mounts when you're finished. If you are using conventional developing tanks, scratch the Uniroller and film drum.

2. Mixing the Unicolor chemicals is fast and simple because all the concentrates are liquid and can be mixed right in the graduate.

3. This is a standard type of water jacket. 105°F water surrounds the chemicals. Water must be exchanged fairly often to fight off cooler ambient room temperature.

4. Here's another way to control the temperature of your important chemicals (the first three solutions are critical temperature-wise: first developer, reversal bath and color developer). You can use 105°F water or have two pots, one with very hot and one with very cold water for fine-tuning the solutions' temperature just prior to development.

ally dry film right next to the sink, but I found that since there was no squeezing step involved in the E-6 process, the film seemed to attract dust. The most dustproof place I found was the inside of the adjacent shower because there are no cloth surfaces nearby to trap dust.

If, even after your precautions, your film still dries with water spots or dust, there is still something you can do. When the spotting or dust is on the base side, you can lightly rub the spot or flick the dust particle lightly with a cotton swab. If the dust or spot is on the emulsion side, it is probably there to stay.



Once your film is drying, suppress the urge to watch it dry. Use that time for cleanup. Clean up chemical stains, rinse bottles and graduates, and put everything back in good order. Color chemistry is not nearly as forgiving as black-and-white, so avoid contamination by a disciplined cleanup.

After the film is dry, you still have one task left before you can sit back and enjoy the radiant beauty of your color slides. You still have to mount them. There are several ways to go about this: You can use the heat-sealing type of slide mount such as that sold by Spiratone and other firms; or you can use the snap-together kind such as the Gepe slide mounts; or you can buy the slip-in type of mount like the Pakon mount by Pako (shown in photo No. 10, page 53). The heat-sealed mounts are my least favorite since I always seem to burn my fingers with the iron at some point during the process. The snap-together type are great but you don't see them much anymore. The slip-in mounts are fast and easy and seem to work well even for people with large hands.

BEYOND NORMAL PROCESSING

The best aspect of home processing your E-6 is the control it gives you—creative control. Try this on for size: Using the four speeds of Kodak E-6 film (ASAs 64, 160, 200 and 400) you can achieve a range of usable film speeds from E.I. 32 to E.I. 6400! You can "pull" the film (overexpose and

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underdevelop) to increase color saturation and reduce contrast, or you can push the film one, two, three or four full stops. Although Unicolor recommends you only push the film two stops, some of the illustrations in this article were pushed three and four f-stops. (See color photos.) Of course, there is a slight color shift, and at times colors seem to merge. Sure, the grain is huge and resolution is impaired; but you are pushing color slide film to a really remarkable speed. With Kodak Ektachrome 400 pushed four stops, you have an effective film speed of 6400!

The "Special Processing for Ektachrome" chart should serve as a guide for push- and pull-processing your Ektachrome transparencies. Times listed are for motorized processing on a Uniroller and Unicolor film drum. *Times only apply to alteration of first developer; all other times for remaining chemicals are normal.*

If you are push-processing your film more than one stop, it is wise to discard the first developer after one use, as it exhausts itself rather rapidly. When processing film normally, the first developer can be used again.

There is one type of special development not seen in the chart, and it is what I call high-key development. I discovered the technique by accident when I processed a roll of Ektachrome 200 that had been pushed one stop, to a film speed of 1600. In other words, I overdeveloped the film by two full f-stops. The results were remarkable, as they exhibited full detail in shadows but with a bleached, mysterious effect (see photo No. 7, page 47). Highlights are still slightly visible, but for the most part they become unimportant. Grain becomes exaggerated and almost pointillistic, while colors take on unnatural hues. It is a very unusual technique and one that calls for more experimentation than can be given here.

COSTS AND CAPACITIES

About this time, you're probably wondering if this process is going to cost you an arm and a leg. Well, you'll be pleasantly surprised to learn that you can process and mount your slides for less than half of what it would cost to send your film out for processing. Yep, that's right, less than half. You see, the one-quart size of Unicolor E-6 chemistry lists for about \$12, and slide mounts cost about \$1 for a 36-exposure roll. Now, you can process eight

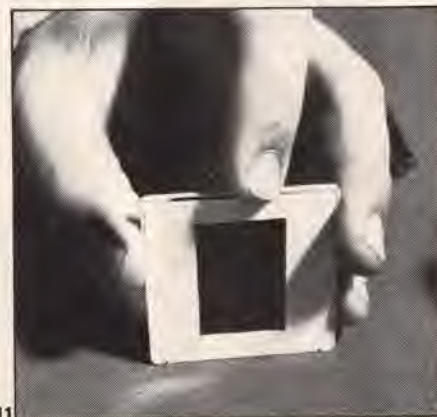


5. A more sophisticated way of controlling temperature is with a Constant Temperature Bath from Photo-Therm. If the water level is maintained, solution temperature remains virtually unchanged from month to month.
6. Loading a Unicolor film reel is simple. Just insert a straight edge of the undeveloped film in the raised guides on the reel and push.
7. Filling the film drum with chemistry is a snap. Timing begins as soon as you begin pouring. Notice the tilt of the drum for easy entry of chemicals. It usually takes 15 seconds to pour, replace cap and get the drum onto the agitator.
8. Once you are into the final washing stage, film can be washed as pictured or by just running 90-110°F tap water over the film. Notice which way the film reels have been loaded into the film drum—bottoms-up.
9. One of the best places to dry your slide film is in the shower where there is little dust. Note homemade rig for holding film clips. It is handy and portable and can be used when no nails or screws can be inserted in shower stall.
10. Mounting your slides is the final step. Slip-in types of mounts like Pako mounts shown seem to work the most easily.
11. Once the slide is inserted into the mount, tap until it centers in the mount.

36-exposure rolls of Ektachrome per kit for a total processing cost of only \$20. To send eight rolls out for processing would cost you roughly \$41.20! That's quite a savings. And if you buy extra bottles of both first and color developer, you can double the capacity of the kit, as the other chemicals last twice as long. If you buy the larger kits, the savings will be even greater.

ANY PROBLEMS?

I probably shouldn't say this, but after processing about 30 rolls of Ektachrome in the Unicolor E-6 chemistry, and after goofing up a few times by missing the temperature of both developers, sometimes by as much as four degrees, I am happy to report that even if you are off by a little on the time or temperature, you will still get



SPECIAL PROCESSING FOR EKTACHROME

When film speed is altered by:

- + 1 f-stop
- 1 f-stop
- 2 f-stops
- 3 f-stops
- 4 f-stops

Use this film speed (E.I.):

- $\frac{1}{2}$ normal
- 2X normal
- 4X normal
- 8X normal
- 16X normal

And use this

1st developer time:

- 4½ minutes
- 8½ minutes
- 11½ minutes
- 19½ minutes
- 26 minutes

Push- and pull-processing chart applies to increase or (decrease) in time for first developer time only. All other times are the same. When pushing film more than one f-stop, use first developer as one-shot developer.

excellent-looking slides. I, too, thought that a $\frac{1}{4}$ -degree tolerance meant $\frac{1}{4}$ -degree, but I guess if that were true, nobody would ever process a roll of slides successfully. There is a fair amount of latitude for error built into the system, and that's an added bonus considering most people are overwhelmed by the fact that they are processing color film at home the first few times around.

If you do, however, do something wrong and your slides look less than

appealing, Unicolor has included a checklist of possible mistakes, some of which are nothing more than a lapse of common sense. But on the whole, your color processing adventures should be mistake-free if you follow the instructions and clean up after yourself.

Regardless of which Ektachrome you shoot, you can now process it for any number of different film speeds, and for half the cost. In an age when less costs more, to get twice as much for half is quite a bargain indeed. □

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TALKING TECH

BY DAVID BROOKS

NO. 16

PHOTOS INTO PRINT

☐ Some writers have the courage to advise photographers about the kinds of pictures they can expect to get published. But the picture needs of the publishing industry are so diverse and change so rapidly that I feel any suggestions I might offer would be obsolete by the time they got into print! There is, however, one aspect of preparing photography for the print media that remains relatively constant but is often totally overlooked. It concerns the technical qualities of a photograph that make it suitable for reproduction.

To become familiar with those technical qualities, we need to have a basic understanding of the way photographs are reproduced. The process of converting the silver or dye image of a photograph into the ink impressions of printing can be best described as a "translation." Like two different languages, the photographic image and the printed image do not correlate exactly. Just as words and phrases in one language frequently do not have precise equivalents in another, the creation of an image with silver in a photograph involves a distinctly different process than the one used to produce an image with ink on a printed page.

Silver is capable of reproducing the reflective values of the subject with a range of gradually or sharply changing tones; this is referred to as a *continuous-tone* process. If you examine with a magnifier a photograph reproduced on a printed page, it becomes apparent that the differences in tone are simulated by patterns of dots. Light tones occur where the dots are relatively small and surrounded by large areas of paper white; dark tones occur where the dots are relatively large with little paper white showing. The process by which this dot

image of a photograph is printed with ink and press is referred to as a *halftone* process.

Unlike a silver emulsion, ink cannot be applied to paper in varying degrees of density with most printing methods, and only to a limited extent with some techniques such as gravure. To obtain a gradation of tones with ink, the photograph containing an image of continuous tones must be translated into an image of dot patterns that simulates the different tone densities of the original. This translation or conversion is accomplished by copying the photograph on high-contrast film through a special screen. The screen converts a particular density in the original into a pattern of dots of a particular size on the copy film. The resulting halftone negative is then transferred by photomechanical means, depending on the printing process involved (lithographic, letterpress or gravure), to the printing material for reproduction.

The reproduction in print of a color photograph is essentially the same as with a black-and-white image; halftones are used to represent differences in tones. Color is introduced by repeating the process three or four times. A color photograph is processed for printing by first converting the colors into black-and-white separation negatives on continuous-tone film using the three primary color filters (red, green and blue), with the option of a fourth to represent shadows and to be printed with black ink. These separation negatives are used to produce halftones that are then transferred to printing plates, which are used to make the impressions one on top of another on the printed page with cyan, magenta and yellow ink. Each screen pattern for each individual color is angled differently while the image is kept in register. This prevents a moiré pattern effect and allows par-

tial overlapping of the dot patterns to simulate complex colors in the image.

You really don't need much more than this basic understanding of the differences between printing and photography to realize that duplicating the qualities of a photographic image in print is not easily accomplished. The tonal range in an original photograph is often far greater than can be reproduced in print. This difference may be minimal with the highest quality reproduction methods, which use fine dot patterns with halftone screens of 200 lines per inch or more, and duotone or double-black printing, which uses two or more impressions of ink to recreate the image. The difference is considerable with the very limited tonal range and coarse dot patterns that are printed on porous, rough papers such as those that make up the daily newspaper.

Imperfections in even the best inks used for printing color images and subtle differences in paper stock coloration are only two of the factors that can change the color rendition of an image from the way it appears in the photographic original. In addition, the dyes in different color photographs vary in how they record on color-separation film. Also, sometimes several color photographs are thrown together with several images on different films reproduced on one set of color-separation negatives, requiring a compromised technique that is likely to favor some of the images more than others.

Besides these fundamental differences in reproduction methods that affect the translation of a photograph into print, there are many more subtle factors that influence the final printed result. Realizing that the exact duplication of a photograph in print is unlikely, the photographer can avoid being disappointed in the way his work has been reproduced if he learns to gear his expectations ac-

cordingly. If a rationalization is needed, remember that very few people will have the opportunity to compare the printed image with the original. If the printed version is effective in its own right and serves the photographer's intentions, then how it varies from the original is irrelevant anyway.

Aside from learning not to expect precise equivalence, there are many more positive steps the photographer can take to ensure the effective reproduction of his photographs. Knowing that the range of tones that can be reproduced in printed form is not as great as what can be recorded in the photographic image, the photographer should adjust a print made for reproduction to these inherent limitations. This modification is easily accomplished in the printing of black-and-white photographs. The object is to bring all the important information in the image into the midtone range of the photographic image.

This may require making the print on a paper with a lower contrast grade than would be ideal to produce a brilliant display image. Or it may involve burning-in some highlight areas and holding back some shadow areas to acquire more apparent detail in areas at the extremes of the tone range. *It does not mean a gray print should be made.* A gray print may well result in a gray reproduction image. Remember, it's the ink and paper stock of the printed image that have the shorter scale than a photograph; the halftone process is quite capable of recording the range of tones contained in normal photographic paper.

Tailoring the color image for reproduction is not as easy once the original image is made because photographic color printing does not allow the simple adjustment of overall and local contrast. Keeping the tonal range of the substantive portion of the color im-



To provide an understanding of printing and of how photographs are reproduced in the print medium, Kodak recently published *Photography & Layout for Reproduction*, publication No. Q-74. Written in language easily understood by photographers, this book offers a comprehensive understanding of printing technology as it affects the photographer's work. Priced at \$5.50, it is available directly from Department 454, Eastman Kodak Company, 343 State Street, Rochester, New York 14650. A more detailed description of printing methods and the preparation of graphic materials for reproduction can be found in *Basic Printing Methods*, publication No. GA-11-1, and *Graphic Design*, publication No. GA-11-2. Both these books are also Kodak publications and may be obtained by writing directly to Department 454 at Kodak.

age within reproducible range is most effectively achieved at the time the image is created, by using appropriate lighting and exposure techniques. Shadows containing important image information should be kept open. Indoors in artificial illumination, the use of adequate fill is desirable for a moderate lighting ratio. If natural light outdoors produces too much contrast between highlights and shadow, a reflector or flash fill should be used. When that option is not possible, a flash exposure of the film to low-level white light prior to the exposure of the subject will open the shadows and reduce contrast.

Because the printer's first step in preparing a photographic print for reproduction is essentially a copy technique, the photographer must ensure that the image will be copied, not the print's paper surface. This means that glossy-surfaced paper must always be used to make reproduction prints. The prints may be finished by air-drying to a semimatte finish or by drying on a ferrotype sur-

face to a glossy finish. Resin-coated papers that are glossy-surfaced dry to a gloss without ferrotyping and are quite suitable for reproduction.

Whether the paper is resin-coated or fiber-based, it should have a pure, neutral-white stock, and the image tone should be neutral black. Toned prints or images printed on tinted/colored paper stock should not be submitted to a publisher for reproduction for the following reason: The printer may make a single halftone negative of several photographic prints on one sheet of film; the films used for halftones are either blue-sensitive or orthochromatic, causing non-standard print coloration to produce unpredictable halftone negative qualities. Also, always make certain you provide prints as large as or larger than the image will appear in print. If a small photographic print has to be enlarged via the halftone process, the paper imperfections will also be enlarged.

The popular high-key and low-key photographic techniques can create special

reproduction problems. With some printing methods it's not always possible to reproduce a pure white background because the dot pattern must be carried across the full image area on the printed page, making a picture that is predominantly composed of highlights look gray and dull. At the other extreme, some printing methods reproduce large areas of pure black unevenly. Sometimes subtle detail in dark tones can be lost toward the end of long print runs due to the accumulation of ink residue, which increases the size of the halftone dots and causes dark tones to become even darker. This merges the tones together.

Ideally the photographer and printer should work together so that photographic image quality and the limitations of printing method and materials can be brought into complementary agreement. However, this is rarely possible on the practical level. Instead, the photographer can obtain some guidance in making photographs technically suited to particular reproduction requirements by studying examples of those printed products and comparing them to other samples that represent the range of reproduction quality possible.

With "quick-print" shops opening everywhere and even small businesses having their own in-shop production facilities, hardly any organized activity of life today is without involvement with some form of printing. Whether publication in a national magazine is likely or not, most photographers will at least be called on to provide photos for reproduction in a local paper or in a business brochure or for a social club poster. So be prepared with the necessary knowledge and techniques to make your photos look as impressive on the printed page as they are when they're displayed on a wall or projected on a screen. □

GREGORY ALAN ROBINSON

A RETROSPECTIVE PORTFOLIO

□ On the morning of Saturday, November 18, 1978, Greg Robinson was killed as he waited to board a plane on an airstrip near Jonestown, Guyana. Greg was 27 years old and a photojournalist. He was on his first foreign assignment for his newspaper, the San Francisco Examiner.

Greg Robinson in no way fit the stereotype of news photographer. He practiced an interpretive kind of photojournalism in which the images were stylized, not static. His photos employed a liberal use of space uncharacteristic of newspaper photography. He did not just rely on the long lens or the tight shot or simply having been there; but he used intelligence and feeling to make his visual statement both important and graphically exciting. Greg's images could be brash or graceful or convey the hardhitting impact of the moment, but they were never callous or indifferent. He loved life, and his images displayed that natural affinity with his subjects.

His gifts were his timing and his personality. He could isolate the peak moment of the flight of a base runner stealing second; or he could light up a group of quiet children into an explosion of smiles, as is seen in one of his last photographs from Georgetown, Guyana.

Greg worried about going to Guyana—he worried about his cameras working properly and having enough film, and he worried about bringing back the best pictures. Greg wanted to be the best—and being best meant not being afraid, and this was as basic to him as knowing which lens to use.

Greg Robinson's final photographs forewarn the threatening madness of that critical time. Representative Leo Ryan after a near-fatal knife attack; the Jonestown defectors waiting for the plane to leave Guyana; the placid calm of lunacy in the eyes of Peoples Temple leader Jim Jones—these shots all seem to warn us of the nightmare that would shock the world. His pictures are our link to understanding what went on in Guyana. His pictures are important to all of us because they are of life about to end.

As a living memorial to Greg Robinson, a scholarship fund has been established at San Francisco State University, where Greg was a student. The scholarship will be awarded to a photojournalism student each year. Contributions to the fund may be sent to The Greg Robinson Memorial Scholarship, c/o the San Francisco Examiner, P.O. Box 31, San Francisco, California 94119.

Greg used Canon cameras and lenses and Kodak Tri-X and Ilford HP-5 Films. The pictures presented here represent a period from 1976-1978. □



Greg Robinson



Greg, NBC soundman Steve Sung (later wounded) and NBC cameraman Bob Brown (later killed) photographing the children outside Jonestown (Photo courtesy of the San Francisco Chronicle)



Children in Georgetown, Guyana



Patricia Hearst entering prison



Greeting Prince Charles; right, San Francisco Mayor George Moscone



Indians clash with federal wildlife officers over fishing rights on the Klamath River

**GREGORY
ALAN
ROBINSON**



Victim of San Francisco street violence



Would-be suicide on the San Francisco-Oakland Bay Bridge



High school horn player



The Rolling Stones' Mick Jagger and Ron Wood at concert in Oakland

GREGORY ALAN ROBINSON



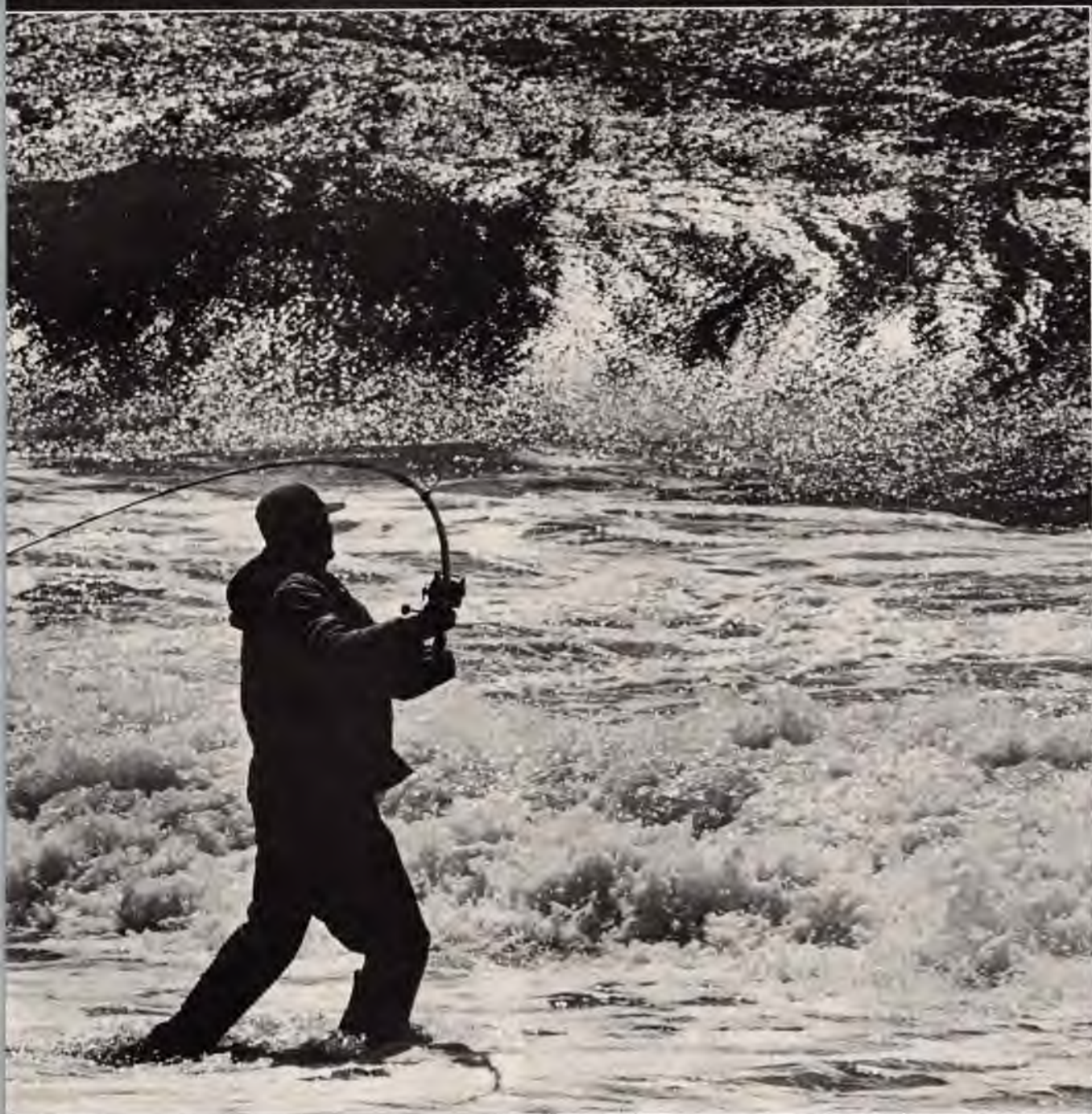
Surf fisherman near Stinson Beach



Stealing second



Piano great Oscar Peterson





Frightened Peoples Temple members attempting to defect



Robinson's final photograph taken moments before he was killed



Representative Leo Ryan collects himself after a knife attack; minutes later he was shot to death

**GREGORY
ALAN
ROBINSON**

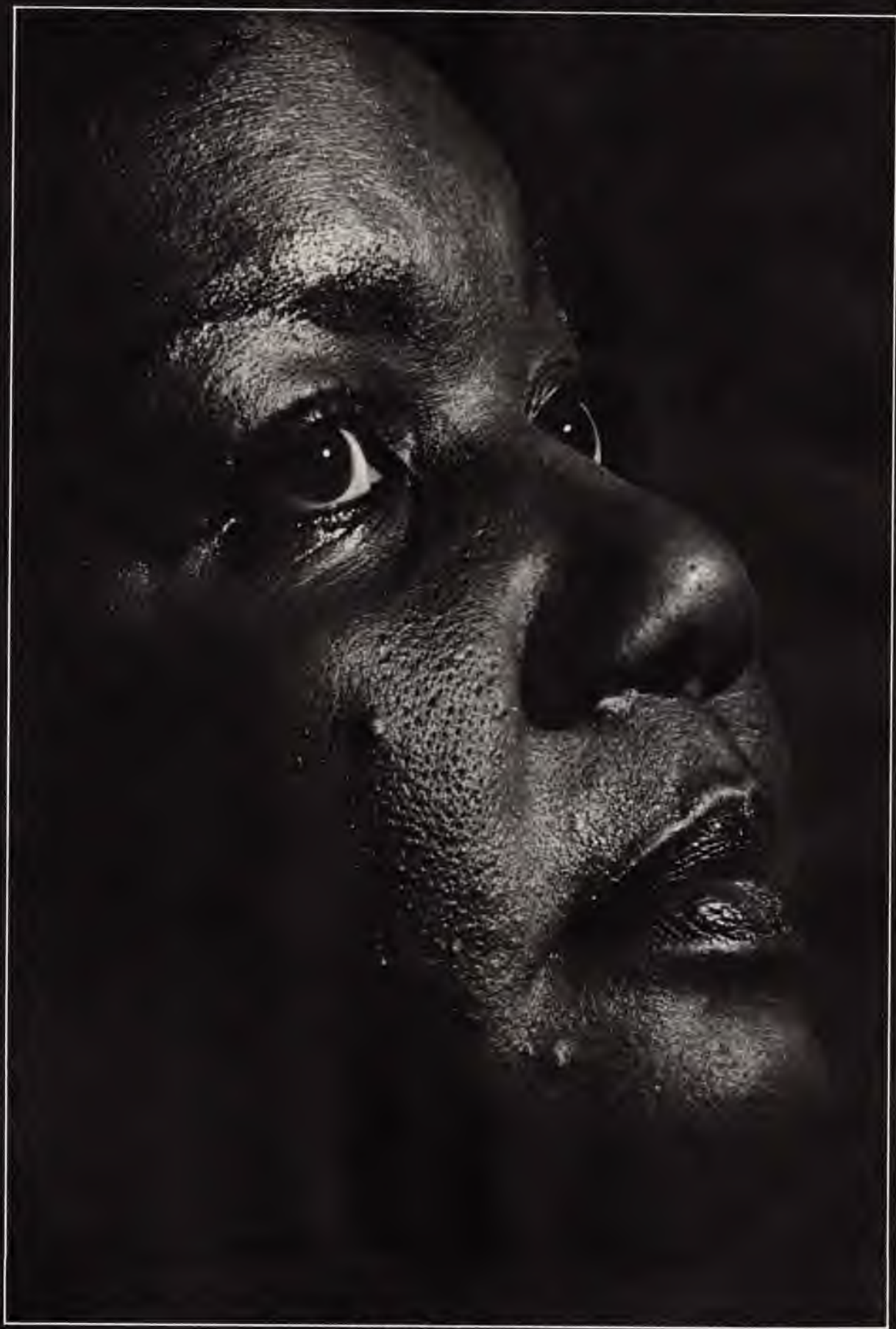


Georgetown child leaning against wall of a house of prostitution



Cult leader Jim Jones

GREGORY ALAN ROBINSON



San Francisco newswoman

KONICA MAKES CAMERA HISTORY AGAIN.



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FIRST TOTALLY
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COMPUTERIZED
35MM SLR.**



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Drop in any standard 35mm cassette, extend the leader, and close the back. That's it.



AUTO START

Immediately after closing the Konica FS-1 camera back, the Central Processing Unit (CPU) automatically takes over and advances the film to frame #1, ready to shoot the first picture!



AUTO ADVANCE

After shooting a picture, the CPU automatically advances the film to the next frame. In fact, we've eliminated the need for the conventional advance lever! Hold down the shutter button for continuous shooting... a full 36-exposure roll in under 22.5 seconds for sequence photography with accurate exposure on each frame, even when you shoot a series starting in bright sunlight and ending in deep shade! Your eye need never leave the large, bright "Control Center" viewfinder. You concentrate on the picture; the Konica FS-1 takes care of the rest.



AUTO EXPOSURE

The Konica FS-1 features the Shutter Priority (SP) system in which you set the shutter speed best suited for the subject you're shooting or for the creative effect you desire. When you first touch the micro-touch shutter button, all systems are activated and the correct exposure is displayed by LEDs in the viewfinder. A new, ultra-sensitive, Gallium Arsenide Phosphide (GaAsP) photo cell is used for ultra-fast, ultra-precise automatic exposure setting. Push the micro-touch shutter release further to activate the new micro-electronic vertical-travel shutter, the mirror and the aperture systems to take the picture.



AUTO FLASH

The matching Konica X-24 Auto Electronic Flash is linked to the camera's CPU. Automatically, the camera advises the X-24 of the ASA film speed in the camera, and then adjusts both lens aperture and shutter speed for flash photography. The Konica FS-1 functions in the normal AE mode for ambient light photography until the flash has recycled to 95% full charge! When the thyristor-circuit X-24 is fully charged (near instantaneously at close-up distances), an LED signal appears in the viewfinder. Auto exposure—and auto flash—all automatic.

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To complement the unique compact design of the Konica FS-1, a new ultra-compact 40mm f/1.8 Hexanon lens was designed. Its wider field and shorter focal length assures greater depth-of-field and consistently sharper results. The Konica FS-1 accepts previous and currently available Hexanon lenses for Konica Autoreflex cameras.

The all-electronic Konica FS-1. There's never been a camera like it.

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11377

AT LAST. AN 80-200 MACRO/ZOOM THAT CAPTURES THE OUTER EDGES OF CREATIVITY WITHOUT THE SHORTCOMINGS.

Konica, pioneer in developing the technology that makes photography a truly creative expression for all, has opened wide the doorway for you to enjoy the numerous advantages of zoom photography with the Konica Hexanon-UC 80-200mm macro/zoom. It's an ultra-compact, ultra-close focus, fully automatic, lightweight zoom lens.

A startling new zoom design, in a lens smaller than ever, at a weight lighter than ever, this new breakthrough in optics is the optimum in zoom photography in the hand-holdable focal lengths. It is the unprecedented answer to the creative photographer who wasn't ready for zoom until...

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Until it was sharper? Critical sharpness at any zoom setting and dramatic contrast at all f/stops make this Konica zoom as precise as conventional fixed focal length optics.

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Until...? Now that this amazing Konica 80/200mm macro/zoom is available, you will get outstanding results with all Konica optics. Whether you use the Konica Autoreflex SLR models or the new Konica FS-1 system, Konica's extensive lens system will help you capture the outer edges of creative perfection. See the total Konica system waiting for you at your photo dealer.

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ZOOM



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PRODUCT PROOF sheet



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The Hasselblad 500EL/M is a special, limited edition honoring the Apollo XI anniversary. The camera has a metallic plaque depicting the moon's surface. Numbered in sequence, only 1500 of the anniversary cameras are being made available. The 500EL/M commemorative model is available only as a complete camera, with Zeiss Planar 80mm f/2.8 lens and standard 12-exposure film magazine. Either black or chrome trim finishes are available. The camera comes complete with a tenth anniversary booklet and a specially minted 2½-inch bronze commemorative coin (supplied upon registration and proof of purchase). For more information, price and availability, contact Braun North America, 55 Cambridge Parkway, Cambridge, Massachusetts 02142.



MOUNT AND FRAME WITHOUT GLASS

An inexpensive mount and frame system that requires no glass is being introduced by Photo-Pro Frame Company. Consisting of a ½-inch-deep smooth board with pressure-sensitive adhesive, frames are self-hanging and have black borders. The suggested retail prices are as follows: 5×7-inch—\$2.49; 8×10-inch—\$4.25; 11×14-inch—\$7.50; and 16×20-inch—\$12.75. For more information contact Photo-Pro Frame Company, P.O. Box 2689, Laurel, Maryland 20811.



CATCH IT WITH THIS

Soligor is introducing its unique 35-140mm f/3.5 zoom and macro lens. A 4X-zoom-ratio lens with a range from medium-wide to medium telephoto, this lens has the added advantage of a 1:3 to 1:10 macro range and permits focusing to less than nine inches from the front element. With a construction of 13 elements in ten groups, this lens is compact (4.9 inches at infinity) and lightweight (28 ounces). Other features include an angle of view from 63 to 18 degrees, and multicoating to decrease glare. The Soligor 35-140mm lens comes in a full range of mounts including Canon FD, Konica EE, Minolta MD, Nikon AI, Olympus OM, Pentax K and Pentax/Universal. The suggested list price is \$599. For more information contact AIC Photo, Inc., 168 Glencove Road, Carle Place, New York 11514.



KEARSARGE INTRODUCES A NEW DARKROOM TIMER

The Kearsarge 402 Darkroom Timer has a four-stack memory for storing four independent times; it resets to a preset time or will automatically step to the next memory position; and its timing range is 0 to 99 minutes, 59.9 seconds in .1-second increments. One-second audio cues are available for burning and dodging as are 30-second cues for film agitation. Other features include a five-digit display that automatically adjusts to darkroom light level to prevent eye fatigue or fogging of high-speed film and paper; auto reset; hold and cancel features; an AC outlet system for enlarger or safelight; a remote outlet for foot switch or multiprint accessories; and availability in either 110 or 220 volts AC, 50 or 60Hz. The suggested retail price of the Kearsarge 402 Darkroom Timer is \$229.95. For more information contact Department D-8, Photographic Systems Division, Kearsarge Industries Inc., 1890 Michael Faraday Drive, Reston, Virginia 22090.



NEW ADJUSTABLE CAMERA STRAP

The Hervic Comfortstrap is an adjustable strap with a lockguard designed to make it virtually impossible for the camera to come loose from the strap. Made from genuine leather, it is available in rust, chestnut, dark brown and black and has a suggested retail price of \$9.95. For more information contact Hervic Corporation, 14225 Ventura Boulevard, Sherman Oaks, California 91423.

(Continued on page 94)

Please mention PhotoGraphic Magazine when inquiring about the items listed in "Product Proof Sheet."

New product information should be sent to the attention of Charlene Marmer Solomon, Managing Editor, PhotoGraphic Magazine, 8490 Sunset Boulevard, Los Angeles, California 90069.

create visual
statements on
liquid canvas

puddle photography onqqle

by julius vitali

Quick flashes of lightning—crack—a thunderstorm travels over the nighttime sky. The weather bureau forecasts clear skies by early morning. Before falling asleep, I set the alarm for 6:30 a.m.

I wake up to the morning news and observe the passing of white clouds. Grabbing my camera, I rush off to where I know a puddle will be. I walk around it a few times to figure out the correct camera angle. In photographic terms, I take a picture of a puddle; in poetic terms I juxtapose objects to create a vivid surrealistic metaphor.

When using a puddle as the major theme for a photo, natural light is the only source of illumination that works. I have tried direct strobe into the water and it was like shooting into a mirror—a white-out every time. And when the sun is too high in the sky, its more direct midday rays burn out the color. Puddle photography is best done between the hours of 6:30-8:00 a.m. and 5:30-7:30 p.m., when sunlight produces deep color saturation in the reflection. The best seasons are spring, summer and fall when puddles are liquid; frozen puddles do not work.

Weather is a controlling factor. Wind, evaporation and type of sky can determine if one should even bother to go out on a particular day. I've set up objects in water and ended up not taking a single picture because of wind. The reflection never stopped rippling. There must be no movement at all in the water.

EQUIPMENT AND TECHNIQUE

A 35mm camera, a light meter, a tripod, four lenses (24mm, 35mm, 55mm macro and 135mm) and rain water are my only photographic tools, but they were chosen by personal preference, and any assortment of equipment is suitable. Every picture is taken at an f-stop of f/11; the shutter speed depends on the type of film used.

I use either Kodak Kodachrome 25 or 64 Film or Kodak Ektachrome 160 or 200 Film. Usually the shutter speeds are bracketed between 1/15 and 1/60 second, making the use of a tripod necessary.

I prefer to work in color as the photographs are more believable. Color represents reality, while black-and-white abstracts it. For these images, there has been no use of superimposition or multiprinting to achieve surreal juxtapositions.

As far as lighting is concerned, sometimes a mirror is employed for fill light to help illuminate a person or object in a reflection. Without a mirror a

two-f-stop exposure difference exists between what is being reflected and the objects placed in the water, the objects always being brighter. Highlights on objects in the water seem unnatural, and a mirror helps create a balance of light.

The focusing point for each photograph is the average distance between the reflected image and the objects placed in the water. For example, if the objects are ten feet from the lens, and the reflection is sharpest with the lens focused on 20 feet, the lens would be focused on 15 feet to make the shot.

It is almost impossible to get both the reflection and the objects in focus unless a lens 35mm or wider is used. Also, a reflection is two-dimensional. With varying lens focal lengths and varying distances of camera to subject, you can control the relationship of object size to reflected-image size.

One of the key ingredients to setting up many of the photographs is a caulking material I have discovered, More-Tite. Because it is waterproof, More-Tite can be used to simulate handwriting or create perspective, and it can also be painted. It can be obtained at any hardware store. If you expect a hot day, refrigerate the stuff before setting up the picture.

In effect, the More-Tite can be used to draw a scene on a "liquid canvas," the canvas being the surface of the water. It is important to realize that natural reflections in the water force the photographer to their scale. Thus, if a sign is reflected in the water and you want to place another word next to it, you have to laterally reverse and

1. *The First Italian Spaceship becomes itself a parody of an ethnic joke. As an American of Italian descent, I find that derogatory references are constantly made about certain elements of the Italian culture. Shot was taken using a 55mm macro lens and exposed at 1/11 for 30 seconds.*

2. *The Reality of the Reflection is a good example of how a title has transformed my photography. It represents a movement toward a synthesis of oil painting, watercolor and photography and was a full year in the making. To create the illusion of being in a room with a ceiling and walls, a protractor was used when positioning the More-Tite in the water. By having a 5° decline, the linear perspective had to follow from the ends to the middle of the picture. Once lines of perspective were established, then the oil painting, frame and electrical socket had to be arranged out of perspective to follow the linear perspective that had been created in the puddle. (To paint or frame a picture out of perspective requires understanding how to creatively break the rules.) Once this was accomplished, I also tried to create shadows in the room. The puddle was transformed into a liquid wall mural; since it was flat on the ground, it did not create a shadow. If one were to place objects on a wall, however, there would be a shadow on the side opposite the light source. Therefore, a side and the bottom of the frame as well as the bottom of the electrical socket were painted gray to create the illusion of a shadow. Then, to create the illusion of ceiling/clouds, white and gray watercolors were mixed directly into the puddle.*



1 THE FIRST ITALIAN SPACESHIP



2 THE REALITY OF THE REFLECTION

turn the word upside down. Usually, shadows are cast when working in direct sunlight, but More-Tite is flat and does not create shadows. This causes the mind much confusion—what the French call *trompe l'oeil* (fooling the eye)—which is what puddle photography is all about.

When an idea is first formulated, focal lengths, focusing, f-stops, etc., do not enter into the creative process. The ideas stem from daily living, since the surreal is always rooted in the real.

Sometimes, after it rains, I jog. It is during this time, after watching the nuances of each passing reflection, that specific planning takes place. I never photograph a puddle without having thoroughly thought out a particular idea. Once an idea has been formulated, the materials are constructed and, if need be, painted before being placed in the puddle.

Once one understands the essence of the medium, then one can deter-

puddle photography bngqle

mine if an idea can best be expressed in a photograph rather than another medium.

Recently, the ideas for my photographs have stemmed from language. First I formulated titles and then transformed them into my particular visual language. Titles add another element, but they tie together my original concept, from mental to visual image.

Surrealistic photography is born out of the desire to understand the human condition. What must be strived for is a poetic awareness of commonplace reality. In this way manipulations of it can become second nature. □

3. *Pie in the Sky* was one of my first puddle pictures. A 55mm macro lens was used to make an exposure of 1/11 for 60 seconds.

4. *Skyte* is an amalgam of "Sky" and "Kite." It was my first photograph using More-Tite (see text). I had tried to have a kite reflected in the water, but this proved to be problematic, so *Skyte* was the result. A 55mm macro lens was used with an exposure of 1/11 for 15 seconds.

5. *Sight Reading* is a poetic statement for all street musicians. I love music, and whenever I've seen a musician playing a solo outdoors, I've wondered if he/she was inspired by invisible notes in the sky. A 24mm lens was used; exposure was 1/11 for 1/2 second.



3
PIE IN THE SKY



4
SKYTE



5
SIGHT READING



6 **LEANING AGAINST THE INCANDESCENT QUESTION MARK**



7 **FRENCH-FRIED MANDALA**

6. In *Leaning Against...* my subject's face was obscured in darkness because she was a great distance from the puddle; a large mirror was used to reflect enough light to balance her reflected image with the chain-and-light-bulb question mark in the puddle.

7. Once I became involved in surrealism, the need arose to break with past references, which resulted in *French-Fried Mandala*. The floating french fries had to be constantly rearranged to achieve this position. Lens was a 55mm macro; the exposure was 1/11 for 30 seconds.

8. In *Eggs Over Easy Street* I wanted the eggs to go from raw to fried in a surreal metamorphosis. How they became cooked is left a mystery, but idle speculation would say they were poached in the puddle. Lens was a 55mm macro; exposure was 1/11 for 30 seconds.

9. To make *Apple Pie*, 13 apples were cut in half and placed in the puddle. Since all puddle reflections are upside down, apples were arranged to spell "pie" upside down. The final photograph is viewed upside down so that "PIE" is readable.

10. *A Figure of Speech* was inspired by a friend's comment that my pictures were visual figures of speech. From the image her words conjured up in my mind, this neuter figure was constructed of different symbols in the English language. A 35mm lens was used; exposure was 1/11 for 15 seconds.



8 **SUNNYSIDE UP/EGGS OVER EASY STREET**



9 **APPLE PIE**



10 **A FIGURE OF SPEECH**



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STORYBOARDING

VISUAL SCRIPTING FOR BETTER MOVIES

BY MARKENE KRUSE-SMITH



ILLUSTRATION BY DENNIS ELLEFSON.

We live in a visual age. We are influenced as much by television and films as by our newspapers and literature. Our generation's visual intelligence is keener than that of our ancestors, and our capacity to observe pictures at high speeds has increased dramatically, since many of us have watched television practically from birth. This shift from literary to visual intelligence can be used to great advantage by filmmakers who, like photographers, cultivate the habit of seeing in pictures.

While verbal expression is an important element in planning, shooting and editing a film, words are only one of the elements of the art of film. The primary unit of expression in film is the image, or the single shot. Movies convey intimacy, intensity and emotion with images that have been carefully manipulated to give the illusion of a particular time and space. One film scholar noted that in everyday life the eyes follow the mind; in the cinema the mind follows the eyes.

Filmmakers use the art of visual scripting in order to think and plan in terms of pictures from the very first stages of a project. Animators developed the visual storyboard, and for them especially it has become an integral part of the total production process. A series of drawings can be far more explicit than verbal descriptions of visual events. The drawings also help define the relationship between the visual images and the movie's dialogue, character development, music and effects, as well as defining continuity and story flow. That's why most television commercials and many feature films are storyboarded before the film is shot. Using this technique, the director and an artist can plan and design the appearance of virtually every shot in the movie.

PICTURE THE FILM ON PAPER

In a movie storyboard a series of drawings or sketches shows key moments in the film. These moments can be high points of action, important sets and locations or anything vital to the film's story or flow. Besides being an important tool to plot out the film's action, the storyboard provides a brief visualization to assist the director and help him communicate the overall concept to his crew.

Motion pictures have much in common with the graphic arts, and movie storyboards closely resemble comic



1. Materials needed to storyboard a movie include plain white index cards or a large piece of poster board, pencils, pens or colored markers, and plenty of good visual ideas. Drawings can be simple black-and-white stick figures or more elaborate, colored renditions for each individual shot.

strips, most of which are quite cinematic. Cartoonists often use close-up views juxtaposed with long and medium shots of their characters to form a series of drawings that imply movement while they unfold a dramatic narrative.

Film storyboarders must keep movement in mind continually. The added dimension of motion will transform a story; the composition in motion pictures is always kinetic rather than static. It's not a single situation but the cumulative effect, the developing plot, that matters. The composition within any frame or exposure of a motion picture is less important than the relationship of the frame to those that precede and follow it.

PLANNING TOOLS AND TECHNIQUES

A storyboard can be a comic-strip-like series of drawings sketched on one large piece of poster board or a series of plain index cards, each showing one shot and telling what will be said while the shot is on screen. The advantage of drawing the ideas on separate cards is that you can always shuffle them around to rearrange shots. If you make a mistake or a better idea occurs, unnecessary cards

can be removed, errors corrected and new cards added.

So far, we've discussed the benefits of using storyboards in order to visualize the production in rough form prior to filming. Drawing talent helps here, but this ability is not really necessary, since very crude sketches, stick figures and still photos cut from magazines can all be used to convey ideas, characters and camera setups that will be used in the movie.

Storyboarding is also used as a presentation technique to communicate visual and verbal ideas to clients. If you're making a film for someone who has had no previous experience with film production, he will be able to envision your ideas for the project simply by looking over your storyboard.

To make the drawings, you'll need poster board or plain white index cards, pencils, pens or colored marking pens and plenty of ideas about what you want to include in the movie. On each card write one idea or point you want to make to achieve the film's objective. If you're working with collaborators, use the collective brainstorming technique. Every idea that occurs to anyone, no matter how unlikely that thought may seem at the time, is drawn or written on a card. Even completely impractical suggestions can often spark excellent ideas.

As you work, remember that motion pictures are essentially moving *pictures*, not moving words. You want to show what the film will look like, and words should only be used to reinforce the visuals or to provide supplementary information that cannot be seen on screen. Each finished storyboard card should include a picture showing the shot's subject and camera angle, a brief commentary or bit of dialogue, if this is necessary, and any short production notes that might aid in filming the subject.

The idea is to use an index card for each visual idea you plan to show on film—one card for each shot, in other words. On the lower part of the card you can summarize the shot's purpose or tell what will be said while the scene is being shown. Use the upper left part of the card to sketch in roughly what you plan to shoot in that scene. In the upper right portion, note the camera location, type of shot (long, medium, etc.) and approximate length of the scene.

When all available ideas have been

STORYBOARDING

sketched, you'll get a good idea of the flow of your movie by laying the cards out on a table or attaching them to a board in the order in which they'll appear in the finished film. Cards bearing similar or overlapping points are grouped together. Ideas that are impractical for filming or that are inconsistent with the objective are set to one side but not discarded—you may need to refer to them later. If new possibilities occur during this editing process, they are written or drawn on cards and added to the others.

Rearrange the scenes until they are organized the way the film will progress, then tack them up on a bulletin board or position the cards on a planning board to check the final progression. Number the cards so their order will be right. The series of cards should now represent the continuity of the ideas in the completed film.

THE PLANNING BOARD

A simple and inexpensive planning board can be made to hold planning cards arranged in a sequence to illustrate the film's story. This device leaves individual drawings free to be positioned and studied simultaneously. Of course it's possible to spread the cards out on a table or floor, rather than using a planning board. The advantages of the board are that the cards are held firmly and won't be easily displaced, and the whole board can be carried from room to room without disturbing the sequence of ideas.

To make the planning board you need a piece of 1/4-inch plywood that's about two feet high and three feet long. The board can be painted and/or framed. A series of 1- or 1 1/2-inch strips of clear plastic should be stapled horizontally across the board, with just enough room between the plastic strips so that the cards can be arranged in horizontal rows to show the story progression. Holes can be drilled through the top of the board for hanging, or it can stand on a display rack or easel. A big bulletin board and lots of pushpins or thumbtacks would serve the same purpose as a planning board with plastic strips if you don't feel sufficient motivation to construct a special gizmo for displaying the cards.

Your aim in arranging the storyboard is to be able to design the whole film in an accessible and easily understood format. Long films may require using several storyboards or setting up the shots according to the scenes in which they will appear. When all of the cards



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2. Write down each idea on a separate card. A simple sketch of the action is augmented by brief production notes and a short verbal description of the shot and important dialogue.

3. These cards can be composed easily, then duplicated in quantity on almost any office copier. If a very large number are needed, it might be simpler to have them produced by a local printer.

4. Planning boards hold a number of cards that can be arranged and studied in order to visualize the production in rough form before filming begins. Ready-made planning boards and printed 3x5- and 4x6-inch index cards are available from Medro Educational Products, P.O. Box 8463, Rochester, New York 14618. Measuring 27 inches square, these durable plastic boards are lightweight and portable.

for the film or a particular sequence have been positioned in the order in which they will be filmed, they can be numbered consecutively and the whole setup can be photographed. This way, if the organization is changed or the original storyboard must be consulted while shooting the film or editing it, you'll have a record of the plan.

VISUALIZING THE IDEA

Unless your storyboard is going to be presented to a client or to potential investors in your project, there's no need to be concerned with making the drawings anything more than rough sketches. Storyboards usually contain rather crude drawings that are intend-

ed to convey an idea rather than display any artistic merit.

The drawings are more finely executed, with details clearly indicated to show exactly what is expected in the finished film, when the storyboard is intended for presentation. Advertising agencies and production houses that shoot television commercials usually employ artists to render colorful, visually exciting storyboards to intrigue clients and convey as much information about the production plan as possible. In this situation a lot of money is going to be spent to show a product to its best advantage in a 30- or 60-second television spot, and a whole creative team is involved with planning the project for maximum impact and effectiveness within the short amount of time that's available.

For an ad agency, a comprehensive storyboard involves a scene-by-scene, cut-by-cut breakdown of the commercial, showing which words will fit with each part of the moving picture. The drawings illustrate exactly what is intended to go on film. The commercial is designed as completely as possible, with exact notations about lighting,

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STORYBOARDING

subject matter and the timing of scenes. When the location and action can't be totally controlled (for example, when the commercial uses street photography during a busy time of day), and it is impossible to determine exactly what will happen on film, many aspects must be left to the imagination and the skill of the director and of the cameraperson.

When the group of agency people is satisfied with the final storyboard, it is submitted, often several times, to the client committee. The intended film is gone over again and again, frame by frame, word by word. Audio or visual revisions may be suggested. Discussions involve the location of shooting, background music, the type of talent to be used, ages and types of actors, type of announcer voice, and tentative costs.

Naturally, a home movie or an art film doesn't have to be as carefully plotted out as a commercial for television. But the ideas and techniques used by professional media people are certainly worth borrowing. The ultimate success of any film directly relates to the care that goes into planning the project. After proper planning, actual filming may require no more than a couple of hours. Adequate planning saves time and helps you make sure that all necessary details are included in your movie. Well-thought-out ideas are much more logical, and good pre-production work can greatly reduce the amount of editing necessary to make the finished film.

5. To indicate a zoom-in on a storyboard, frame the terminal point of the zoom, then draw arrows toward it from the panel's corners. A zoom-out is indicated by reversing the direction of the arrows.

MAKING IT ALL MAKE SENSE

If you can write a short statement of your objective for making the movie, or write a brief description of the film's plot or action, then you've got a good beginning. Next, list each procedure, every point you want to include in the finished film in order to achieve your objective or advance the story line. Each of these ideas is written on a separate card. Remember that your movie will be a series of rapidly changing images, logically connected to convey the story you want to tell. Keep in mind that motion pictures give you the opportunity to show the subject exactly as you want your viewers to see it. You can change the location of the camera. Move in close to show interesting detail; back away to reveal the overall scene. The creative decisions are all yours!

At this point, planning is completed and you're ready to start getting your ideas on film. You've saved a great deal of time and effort in filming and editing your movie, and fully a third of the filmmaking process is completed. Actors, color, music, sound effects, pacing, continuity and the movie's point of view will all affect the film as a whole. But most of these elements are already planned in the storyboard, along with ideas for transitions, titles and credits. You've constructed a firm creative bridge between your movie ideas and the reality of the projected image. □

THE Y.O.B SYSTEM, PART III

MAKING AND EVALUATING YOUR FIRST Y.O.B NEGATIVES

BY PARRY C.YOB

The second article in this series provided you with a completed evaluator, ready to use, and from the first article in this series you learned that your enlarger would require a tonal range somewhat greater than what is recommended by manufacturers if you were to get the most from available enlarging papers. So far we have ignored color photography completely, and we will continue to ignore it for the time being. However, I want to repeat that the Yob System works very well indeed with color photography—with the color negative process resulting in color prints, and with the production of color slides, from which reversal color prints are made. Color will get full coverage in a later article in this series, and everything you read here will be useful to you then.

At this point you have probably been wondering just how you go about taking a picture of a scene with a nine-stop range and reducing this to the four- or five-stop range required by the absolute standard, let alone cutting it back to the slightly more than 2½-stop range suggested by paper manufacturers. Before I go into the making and evaluating of the Yob System test negatives, let me point out that this is seldom a problem with the modern films and developers I have tested. There are exceptions, such as night scenes with street lights or neon signs appearing in otherwise totally dark areas, and interior photos with large sunlit windows; but too great a range is seldom anywhere near the problem most writers make of it. In the tests you'll conduct by using the procedures outlined in this article, you will learn that the



problem is usually that the range is too short rather than too long.

Before you can adjust your picture-taking technique to produce negatives that match the requirements arrived at in making your absolute standard (see "The Yob System, Part I," February, 1979 issue) you must first find out where your present technique, film, developer and camera have placed you. That is, you have to know where you are before you can tell where you are going. To do this, you will photograph the evaluator with your favorite film and develop it by your usual procedure for time, temperature and agitation.

However, before you start to photograph the evaluator you should have your shutter calibrated, particularly if you are using a sheet-film or roll-film camera with a between-the-lens shutter. At speeds slower than 1/500 second, focal-plane shutters of modern 35mm cameras are usually reasonably accurate, but between-the-lens shutters are seldom accurate at speeds above 1/125 second, and in either case a calibration is worth the cost. Make sure the repairman gives you a calibration record that shows the shutter speeds for each setting in fractions of a second, not a percentage reading, a millisecond figure, or some vague statement that the shutter is within manufacturer's specifications. You should also calibrate your light meter; to do this you can use the calibrator for which I gave construction details and operating procedures in the June, 1978 issue of PhotoGraphic. Or, if you wish, you can take your shutter speeds and light meter calibration on faith and proceed with what follows, and the Yob System will to some degree correct for meter and shutter errors if you have only one meter and one shutter. However, if you own more than one camera or more than one lens and shutter, and any one of them is in error, you will not be able to use the system to full advantage until you're aware of that error.

GETTING THE RANGE

Set up the evaluator in full sunlight on a day when the sky is clear and can be expected to remain so for about half an hour. You should never set the evaluator up over a snow-covered or highly reflective ground area,

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since this will reflect unwanted fill light into the shadow of the shader. The ideal location is on a grass lawn on the north side of a building with the evaluator in full sun and the photographer in the comfortable shade of the building. An asphalt driveway or a concrete sidewalk normally does not reflect enough light to interfere with the use of an evaluator when the tripod rests on it. Also, if you live in an area where high gusty winds are frequent, you may have to take precautions to protect the evaluator from being blown over by the wind.

Attach the evaluator box to your tripod after first removing the evaluator front to make the mounting easier. Attach the front and use your pan head to adjust the evaluator so that the front surface is vertical. Attach the shader to the evaluator at the right side of the top of the frame if it is morning and at the top left if it is afternoon, in the northern hemisphere. If it is high noon, place it right in the middle of the top. If you are using a handheld light meter, take readings of the sunlit white surface and of the interior of the black hole in the evaluator, and then rotate the evaluator on the pan head until you have a total range of roughly nine steps or stops between the surface and the hole. Most modern 1" meters and many other handheld meters are designed so that the meter scale reads in numbers starting at about 3 and going to about 18. On these meters a needle movement of one full number is equal to one step or stop. That is, a change of one number requires a corresponding aperture change of one stop or a change in shutter speed of one stop. That step would be a change of 1/30 to 1/60 second, for example. If your meter is so designed, a typical nine-stop range would give readings of 16 on the white surface and 8 in the hole. The range includes both ends of the readings, not the difference (which would be only eight stops). That is, $16-8=8$, but if you count on your fingers from 8 to 16, including both 8 and 16 in your count, you'll find you come out with 9—try it!

If you are using a meter that has unnumbered markings, or a through-the-lens meter on a camera, the method is a little different. For the through-the-lens metering system you set the aperture at $f/16$ (this being the smallest stop on most 35mm camera lenses), then adjust the shutter speed

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nine-stop range between Y_m and B. If it becomes necessary to drop to an eight-stop overall range to maintain the three-stop difference between O and Y_m , this can be safely done. However, if the shader on the evaluator is adjusted so its shadow falls across the black hole of the B area, both the three-stop difference and the nine-stop range can almost always be maintained.

After recording the data for your readings, set the meter at the ASA value recommended by the manufacturer or at the value you have been using in the past with the film you have selected for testing. When working with a new film or a new developer, I always start with the ASA rating given by the manufacturer. Using this setting and the reading for the O value (that is, the shadow on the white surface), determine appropriate shutter and aperture settings. Record the shutter speed in the 1/s column and the f-stop in the f/ column. Record the ASA rating in the ASA column beside the number 1. The choice of shutter speed should be governed by accuracy more than anything else. If, for example, calibration has

shown that 1/60 is dead on and other speeds are less accurate, you should use 1/60 if the ASA rating allows it.

Now make your first exposure at the settings you have recorded. Then, leaving the shutter set at the same speed, open the aperture one stop and record the shutter and aperture data in the proper columns on the No. 2 line. Opposite the number 2 record one half the ASA value that was opposite number 1 and make your second exposure using these settings. Now open the aperture one more stop and record the ASA value as being $\frac{1}{4}$ the original value. Again record the actual settings from the camera and make a final exposure. I urge you to check the camera settings of shutter and aperture each time simply to eliminate the possibility of turning the aperture ring the wrong way and closing it by mistake instead of opening it. (It's a mistake I've made, so I expect others to make it too.) You should make your three exposures as quickly as possible after making your light readings, because the movement of the sun or incoming clouds can make changes in the light.

After making your third exposure, you can use the rest of the roll for whatever you want, using your normal

or manufacturer's recommended ASA value for the rest of the frames. In any case, expose the rest of the roll to something even if you have to take pictures of your feet on the sidewalk.

When the film has been entirely exposed, develop it according to the manufacturer's recommendations or your preferred development time in the developer of your choice.

Now that the film is dry, the moment of truth has arrived; We begin the tests whose results will probably shock you if you've been using the manufacturer's ratings for ASA, developer, and development time, particularly with fine-grain developers.

To ease the shock, let me remind you that ASA ratings are a technical thing based only on the number of foot-candles of exposure or the number of meter-candles of exposure required to increase the density 0.10 above the base of the film at a certain stage of development with a standard developer (that often has no relation to the developer you will be using.) So, don't be too quick to blame the manufacturer for things that are dictated to him by all sorts of regulatory bodies set up by government and industry.

Proceed by setting your enlarger head at the mark you made when finding your absolute standard by the instructions in "The Yob System, Part I." Now use the same aperture you used in those original tests, and with the negative sharply focused on the paper make a test strip of the B or hole area of the image on the same grade No. 2 paper you used before. Use the same procedure you used to determine the time for a maximum black for the absolute standard; and when you have determined the time required for maximum black with the first (No. 1) negative of the evaluator, you will have discovered something about the density of the B area. Subtract the absolute-standard exposure time from the new time, then divide the difference by the old time. Multiply the resulting number by 0.30, and you will have the difference in density between the 0.10 B area of the absolute standard and the B value of your negative. If the time turns out to be less for your negative than for the absolute standard, it simply means that the B area of the negative (remember B stands for black) has a lower density, and you just subtract the new time from the old time to start.

Now make a full-size print using the time for maximum black on the B area, but move the easel up or down so that the white Y_m part of the image actually



ALL PHOTOS BY THE AUTHOR.

overlaps the blades of the easel. Develop this print fully and examine the result. Don't be too surprised to find that the nice bright white, which was eight stops brighter in the subject, now comes out to be a muddy, if not a dark, gray. Using the recommended times for Kodak Microdol-X with 120 Kodak Plus-X Professional film rated at the recommended ASA of 125, my whites came out to be very dark.

Now make additional prints, stopping the enlarger lens down one stop at a time until the white of the Y_m area is just as white as the print's border. When you have just matched the border, determine how many stops you have closed the lens, and multiply this number by 0.3 to discover the approximate difference in density between the Y_m area of your evaluator negative and the Y_m area of your absolute standard. In most cases you will find that your evaluator negative has a lower Y_m density than your absolute standard, and if the film manufacturer publishes time vs. contrast index or time-gamma curves for your particular film/developer combination, you can use this density difference to estimate

2-10. These photos, fully explained in the text, illustrate the step-by-step testing done by the author using Kodak Plus-X Professional Film and Microdol-X developer with the Yob System.

how much you must change your development time to match the absolute standard. However, before worrying about this, you should repeat the process with the remaining two negatives of your test series because this is important to understanding the errors glossed over by other systems of evaluation such as the nine-negative test.

Find the time to print a maximum black with each of the remaining two negatives, then make a full-size print and see if the Y_m values are as white as the border of the print when properly developed. Chances are you will find that even when your ASA value has been cut back to $\frac{1}{4}$ the recommended value and you are now giving four times the recommended exposure, you still cannot get a pure white Y_m area when you print for a maximum black in the B area. If this shocks or frightens you, remember what I said earlier about ASA ratings and "standard" developers. Also remember I warned you that you would find the Yob System

would turn up surprising differences between what your enlarger really wants and what paper makers sometimes suggest. Now you have it both from the absolute standard and from your set of evaluator negatives, and you should be ready to accept the necessary corrective action based on faith in tests you yourself have conducted on a set of subjects you can go back to over and over again.

To eliminate the danger of adding confusion to controversy, we will at this point go through a set of working examples step by step in order to make sure that you will have some permanent reference material with which to compare your own work. In this case I had decided to test Kodak Plus-X Professional roll film because its advertised characteristics were suited to outdoor photography and the film was available in the long 220 rolls, which give me 20 exposures in my 6 x 7 Mamiya RB67 camera. What follows is the exact procedure I used.

The evaluator was set up and photographed under conditions where my Honeywell 1° spot meter gave readings of $Y_m = 15.6$, $O = 12.5$, $B = 7.5$, and



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Y.O.B SYSTEM

$Y_g = 13.5$. As usual the Y_g or gray card in the sun gave one full stop greater brightness than the O reading, and if I had used the gray card reading to establish my initial exposure, everything would have gotten one full stop less exposure. I'll have more to say about this in a later article, but I want to be sure you know that using the Yob System O reading usually results in one full stop more exposure than the gray card system. Using the Kodak ASA rating of 125, I established that the exposure, based on the O reading, was between f/11 and f/16 at 1/60 second. This particular meter has been calibrated and found to have a consistent error wherein it reads $\frac{1}{2}$ stop low, and this was compensated for by setting the calculator dial at a $\frac{1}{2}$ -stop higher ASA rating, or ASA 200. The film was then given exposures corresponding to a true ASA of 125, and then 64 (that is, between f/11 and f/16 at 1/60 second and between f/8 and f/11 at 1/60). The film was then developed at Kodak's recommended $6\frac{1}{2}$ minutes at 70°F with agitation for the first full minute and then by inverting the Nikor wire reel tank twice every 30 seconds.

The ASA 125 negative was placed in the carrier and the enlarger adjusted to the permanent mark established for the absolute standard in the first article of this series. Photo No. 2 is the resulting test print wherein the B area (black hole) was given a series of test-strip exposures to determine the exposure needed for maximum black. This showed that the maximum black was obtained with an exposure of 35 seconds at f/11, and this exposure was used to make the print in photo No. 3. It is obvious that the Y_m area is a dark gray, but at this point a less experienced photographer might conclude that the film had been underexposed. To avoid this error we go to photo No. 4, which was made from the ASA 64 negative of the same roll; another test-strip exposure was made to determine the exposure that gives maximum black in the B area. Keep in mind that what we are determining here is the minimum exposure that will give the maximum black in this area. That exposure was found to be 40 seconds at f/11, and photo No. 5 shows the resulting print. In early experiments with the Yob System, I carried such tests to the extent of reducing the ASA values to ever lower settings, but ex-

perience has shown that reducing the setting from 64 to 32 would have made little improvement in the Y_m whiteness if any at all, and a reduction to ASA 16 would have actually made things worse because at some point the B area begins to get enough exposure that its developed density begins to rise in proportion to that of the Y_m area. You can experiment for yourself, but my experience indicates that changing the manufacturer's ASA rating by the equivalent of more than one stop in either direction will not work out satisfactorily. Because of quirks in the ANSI method of establishing the speed point and ASA ratings, certain films must be given manufacturer's speeds that are not realistic for their most popular developers, but I have found no case where the ASA rating had to be more than cut in half or doubled when proper development was given.

There are many popular misconceptions that the ASA rating changes drastically with changes in development, but because of the ANSI methods of establishing the ratings, this simply is not true. Development affects the Y_m and the O densities greatly but has a much lesser effect on the B densities, which would be the ones ordinarily used in establishment of an ANSI ASA rating. More about this in the later technical article, but let's get on with these tests.

Since photo No. 5 showed that decreasing the ASA was not indicated, it was clear that a drastic increase in development time was needed. Because I was using Microdol-X, which is a pretty typical fine-grain developer whose time-gamma curves are not very steep, I simply doubled the development time to 13 minutes at 70°F. The evaluator was set up in full sun so that the light-meter readings of the Y_m , O, and B areas were essentially the same as with the first roll; and a series of exposures were again given at ASA 125, 64 and 32, based on the meter reading of the O area. The film was then developed for the 13-minute period, using the same agitation schedule as before. Photo No. 6 is the test-strip print that establishes the exposure for a B-area maximum black at 40 seconds at f/11, and photo No. 7 is the final print using this exposure. Notice the dramatic change in the Y_m whiteness. Indeed, all of the areas except the B area are now much lighter, while the B area remains at the maximum black the paper is capable of producing.

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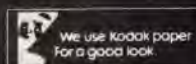
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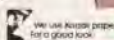


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	24 exp.	5 x 7	14.25	7.13
	36 exp.	5 x 7	19.50	9.75
120	8, 10 exp.	4 x 5	3.50	1.75
	12 exp.	5 x 5	3.50	1.75
	15 exp.	4 x 5	4.25	2.13
	8, 10 exp.	5 x 7	6.25	3.13
	12 exp.	5 x 7	7.25	3.63
	15 exp.	5 x 7	8.65	4.33
220	16, 20 exp.	4 x 5	7.00	3.50
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days, and the print developer was fresh in one case. However, to avoid the appearance of having somehow cheated, an additional print, photo No. 10, was given 47 seconds at f/11, which is the equivalent of a 1/2-stop increase in exposure, and its Y_m areas remained border white.

While the peculiar combination of an ANSI ASA rating, the choice of Microdol-X developer, and Kodak's recommended development times for 120 and 220 Plus-X Professional roll films may seem overly dramatic, it is a cold hard fact that in recent years there has been a general tendency to underdevelop films with the mistaken idea that a reduction in negative contrast was needed. There is another equally mistaken idea that underdevelopment or reduced development always leads to a less grainy negative. This latter idea probably stems from the fact that many people have not been capable of telling the difference between an overexposed negative and an overdeveloped negative; and when an overexposed negative is overdeveloped, it does indeed give more grain. However, it should also be pointed out that when using more active developers such as Kodak D-76, overexposure can lead to terrible grain problems even with underdevelopment.

Finally, there has been a recent tendency for photographers and film companies to worry too much about saving a few minutes of darkroom time. A photographer will spend thousands of dollars on equipment, travel great distances at great expense to take his pictures, then foolishly worry about saving a few minutes in the darkroom by reducing the development time.

Congratulations. Now that you have stuck with me this far, you are through with the hard part of the Yob System. You know how to establish an absolute standard, you know how to build and photograph an evaluator, and you know how to use your enlarger to guide you in the adjustment of your processing for optimum performance. In the next article in this series, I will go into the practical application of the Yob System under the various working situations any all-around photographer might expect to encounter. From here on you'll find the going much easier, since you've already learned the nomenclature, and you've conducted enough tests to gain confidence in what you are doing. In fact, the rest is so easy and the results are so good that you should be both surprised and delighted. □

Y.O.B SYSTEM

of photo No. 7 indicates that the Y_m area is still not printing at quite the true border white even though it is much improved. By using the method of changing the enlarger f-stop described earlier, I estimated the change in density that had been caused by the 100-percent increase in development, as well as the difference between the Y_m density of the 13-minute negative and the 1.60 density of the Y_m section of my absolute standard. From this I

estimated that an additional two minutes' development would be required. Another roll of Plus-X was exposed to the evaluator, this time using only the 125 ASA rating, and was developed for 15 minutes at 70°F with agitation the first full minute and every 30 seconds thereafter. Photo No. 8 again establishes the exposure for maximum black, which appeared to be 35 seconds at f/11; and photo No. 9 is the resulting full print. The difference between the time given to print No. 8 and to print No. 6 is accounted for by the fact that they were made on different

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(Continued from page 69)



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advertising index

A.I.C. Photo, Inc.	13
Alfa Color Lab	88
Antonelli School of Photography	96
Artography Academy of Photographic Arts	105
Asanuma Corp.	41
Associated Photographers International	21
Berkey Marketing Co., Inc.	15, 65-68
Beseler Photo Marketing Co., Inc.	82, 84, 86, 89
Blackhawk Films, Inc.	105
Bogen Photo Corp.	39
Bridal Studios	96
Brooks Institute of Photography	14
Burleigh Brooks Optics	48
Camera Provisions	103
Canon, USA, Inc.	29-32
Contemporary Frame Co.	86
Creative Framemakers	51
Creative Photography	52
Crown Products, Div. Chilcote Co.	96
Eastman Kodak Co.	24-25, Cover 4
Fishback School of Photography	94
Fortune Photographic Products	51
Gillette/Trac II	2
Gossen	15
Graphik Dimensions, Ltd.	23
Ilford Inc.	15
Jet Color Lab	93
Kelly Color	52
K-M Enterprises	94
Konica Camera Corp.	65-68
Laurel Camera	104
Liberty Photographic Laboratory	87
D. D. Little Photographic Studios	104
Maxwell Photo-Mural Tanks	94
McGilligan	52
Meisel Photochrome Corp.	99
Minolta Corp.	42-43
Modern Photo Bookstore	38
National Artists Alliance	37

National Camera	36
New York Institute of Photography	17
Nikon	Cover 2-1
Novacon Products	51
Ohio Institute of Photography	23
Olden Camera & Lens Co.	105
Olympus Corp. of America	74-75, 90-91
Pentax Corp.	6-7 107, 108-Cover 3
Photographers' Inventory	96
Photography by Lessnau	52
Photography Learning Systems	86
Photo Materials Co.	95
Photo-Therm	52
Pierce Co.	82
Pioneer	23
Porter's Camera Store, Inc.	104
Pro Color, Inc.	52
Professor Bloodgood's Photographic Emporium	82
Pro Photo	51, 82
Rhode Island School of Photography	51
Samigon, Div. Argraph Corp.	94
Shutterbug Ads	52
Skrudland Photo Service	105
Stormy Dawn Color Lab	96
Superior Bulk Film	52
Testrite Instrument Co.	96
Total Vue Color Labs	96
Travel Institute, Div. Career & Craft	105
20th Century Plastics, Inc.	11
Unicolor Div., Photo Systems, Inc.	49, 79
Visual Horizons	52
Vivitar Darkroom, Vivitar Corp.	5
Wedding Photographers International	48
Zone V	94
Zone VI Workshop	53

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Just after the turn of the new year this January I received a delightful surprise in the mail here at the magazine: a calendar from the Portland Camera Club in Portland, Maine. But it was no ordinary calendar. Printed in sepia ink on cream-colored paper were 12 different photographs—lantern slides, actually—that had been taken between 1900 and the early 1920's. The quality of the calendar itself, which was obviously not a slick commercial job, and of the images inside it was astonishing.

The photographs ranged in subject matter from reportage—a 1910 record of Houdini performing a heroic escape before a huge crowd; a primitive airplane being given a push start in 1910—to idyllic country scenes suggestive of paintings, where children gathered wild daisies in their Sunday finery or two fishermen waited by a stream in the endless calm of a country afternoon in 1915. There were studies in form and tone—a woman in black walking down a snowy city street or a train on a bridge juxtaposed with its mirror reflection in the river below—and scenes of four- and five-masted sailing ships in silvery harbors.

The photographs were marvelously evocative of the past, which was especially made tangible by a group portrait of the Portland Camera Club on an outing. Looking at the diverse group of men and women arranged on and around the engine of a train in their 1914 garb (everyone wore a hat—no jeans there!) I felt a kinship mixed with a poignant sense of distance. But the lasting impression was one of wonder, for these lantern slides created a sense, as only photography can, of the continuity of human experience and compressed the 65 years between then and now into an insignificant instant.

To find out more about the calendar and how it was put together, I got in touch with the Portland Camera Club. According to Alan Farr, the club's secretary, the photographs in the lantern slide collection were taken by early members of the club, many of whom had organized the club in 1899, making it one of the oldest camera clubs in the country. Many members were professional photographers and painters, and some were influenced by the Photo-Secessionists, with whom they were contemporaries. "The slides were stored away and forgotten for many years," says Farr. "A few years ago I came across them and saw many possibilities in them. I cleaned and sorted them, trying to put them into categories and identifying them wher-

CLUB CLOSE-UPS

ELISSA ROBELLINO

A CLUB WITH A SENSE OF HISTORY

ever possible. The slides consisted of landscapes, portraits, some photo-journalism, everyday street and waterfront scenes, people going about their everyday business."

In 1976 Farr put together a slide show from the lantern slides. The Bicentennial activity that year created much interest in local history, and club members contributed antique cameras and other photographic paraphernalia to the show. The show was very successful, and Farr kept it



together so that it could be made available to local organizations for a small fee.

After the success of the slide show, and seeing the enthusiasm with which it was received, Alan Farr had an idea for showcasing the lantern slide collection in a more permanent way: "By trade I am an offset pressman, and a few of the other members are involved in the graphic arts field in one way or another. I knew if we pooled our resources we could produce a calendar. We have added halftones of the winning monthly prints in our bulletins successfully without going to a commercial printer, which would increase the cost tenfold. I brought the idea of the calendar to the club's executive board with an estimate of its cost. They thought it was a good idea, and a committee was formed."

"We viewed about a hundred slides, and by process of elimination chose the 13 for the calendar. From there we had the halftones made. One of the members, David Higgins,

copied the slides on a light box with a Polaroid MT-3 using a 2 1/4 x 3 1/4 roll-film back with Kodak Panatomic-X Film developed in Kodak HC-110. Peter Doe then made the prints using Kodak Polycontrast RC paper. These were returned to David, and he made the halftones using a 100-line screen. In the meantime, another member, Jim Brady, set the type after the committee decided on the format to be used. David made the negatives for these also.

"I received permission at work for the use of their equipment for the remainder of the work. I stripped the negatives two up, ran the calendar on my press, and did the assembling with the help of a couple of the ladies with whom I work."

The committee decided on a price of \$3.00 for the calendars, \$3.50 for mail orders. Some calendars were purchased by members for Christmas gifts, and some were distributed to local retail dealers. A full-page review with photos in the *Sunday Portland Press Herald* brought in many more orders. Though the response has been good, the club decided that to make the calendar more profitable next year (they will probably just break even this year) they'll try to get the calendar out earlier to more distributors, and advertise.

As a result of presenting the slide show to a local women's organization, Farr was approached by one of its members and offered a collection of hand-colored lantern slides taken in Germany from 1912 to 1915. The club gratefully accepted them and is planning ways to use them.

The Portland Camera Club hopes to produce the calendars for a few more years with the remaining slides in the collection. They also hope to get a grant to copy the slides and preserve the original 3 1/4 x 4-inch glass slides. "I would like to be able to present prints of the slides to historical societies and put on an exhibit of the photographs," says Farr. "There are many other ways they could be used with a little imagination. The slides have historical importance to many communities and historical societies here. Much has changed since they were made; I feel they have been stored away long enough and should be put to some constructive use." □

Join a Camera Club: Just send a self-addressed, stamped envelope along with a list of nearby zip codes to Camera Club Editor, c/o Petersen's PhotoGraphic Magazine, 8490 Sunset Boulevard, Los Angeles, California 90069.

☐ Do collectors prize the innovative camera? You bet they do—in fact, you'll have to look long and hard to find a collector worth his salt who doesn't. Oh, sure—most of you will decry the latest technological advance as being against God and Nature, but I doubt if any would pass up a chance to add a Kodak Ektra or Leica A to their collection; yet in their day such cameras were also taken to task by some for their innovative nature. The hard-core collector knows there are a good many equally innovative but lesser-known cameras. Those of a speculative mind are beginning to search them out with an eye to a day not so far away when they too may be eagerly sought by another generation of collectors. So just for kicks this month, let's look at a few of these interesting but more recent innovative cameras, since each is destined to play an increasingly important role when the history of photographic hardware and its development is finally written.

Let's start with automatic exposure control. It's all the rage today—in fact, this column recently discussed the impact of the first such camera, the Kodak Super Six-20. But since the Japanese now dominate the camera industry, are you familiar with the first Japanese auto-exposure camera? Well, the year was 1960 and the camera was the Olympus Auto Eye. This was a 35mm application of an auto-exposure concept used in a 1958 prototype 127 twin-lens reflex called the Olympus Eye 44. There was nothing really unusual about the Auto Eye's appearance or operation—it used the same selenium meter/"trapped needle" concept as the older Kodak folder. Once the film speed was set, selection of the shutter speed controlled the size of the aperture according to a galvanometer. Depressing the shutter release activated the system, and over- and underexposure indicators as well as the correct aperture appeared in the viewfinder. As the first such Japanese camera, the Auto Eye has its place firmly fixed in photographic history.

Interestingly, the Auto Eye had a very brief life. It was challenged in the marketplace by the Canonet (1961), lost the battle for survival, and was discontinued in 1962. And what was more innovative about the Canonet? Oddly enough, this camera's basic appeal was the use of another innovation pioneered by Okaya Kogaku on one of its Lord models. Lord, a little-known brand in the U.S., placed the selenium meter cells around the front lens element on its Martian model—a now-common

VINTAGE VIEWFINDER

KALTON C. LAHUE

ARE INNOVATIVE CAMERAS WORTH COLLECTING?

configuration for rangefinder cameras. Canon simply followed the leader in this case and came up with a winner, while the Lord quickly went down the proverbial "tube."

Equally fascinating and innovative were the efforts of Minolta in shutter development. Its Uniomat model appeared in 1960 with a new five-blade leaf shutter developed in cooperation with Citizen Watch, a manufacturer of camera shutters at the time. The shutter was programmed to provide



The first Minolta to feature the company's revolutionary shutter was the V2 of 1958, which had a top speed of 1/2000 second. (Photo courtesy of Minolta Corporation)

exposure automation by using its blades, rather than a separate diaphragm, to form the required aperture. The Uniomat's match-needle exposure system was marked only in exposure value (EV) settings and had a range of EV 18 (f/16 at 1/1000 second) to EV 6 (f/2.8 at 1/500 second).

When the shutter release was depressed, the five blades opened to a point predetermined by the EV setting, then closed. This motion created the aperture. It also made faster shutter speeds possible with smaller apertures, since the blades did not have to open very much to create an f/11 or f/16 aperture. Until the Uniomat came along, the only leaf shutter to exceed a top speed of 1/500 had been the Kodak Synchro 800.

This shutter design was not restricted to the Uniomat; a variation had been used previously in the Minolta V2 (1958) and V3 (1960), which featured top speeds of 1/2000 and 1/3000, respectively. But neither of these cameras coupled the shutter to

the exposure system; the V2 had no meter and the V3's meter was non-coupled. Unfortunately, the dual-function shutter design had its own built-in limitations—at higher speeds it could not produce a large aperture. But the concept lives on today in the form of some instant and 110 camera shutters.

One of the big names in postwar 35mm rangefinder cameras, Aires Camera Works, was responsible for the first such camera to incorporate match-needle metering in the viewfinder—the Viscount M2.8. This was quickly followed by the Aires Radar-Eye, which combined the coupled rangefinder with a bright-frame viewfinder. Its viewfinder automatically corrected for parallax and contained the exposure meter and match needles. These two innovators were the last gasp of a dying marque; the company had taken a flier in the field of leaf-shutter single-lens reflexes with its Ever and Penta 35 models. They failed, and Aires closed its doors in July 1960, three months after the Radar-Eye was introduced.

The Japanese seemed particularly fascinated with the idea of a leaf-shutter SLR. Even Nippon Kogaku, manufacturer of the Nikon F (1959), spent several years flirting with the concept in the early '60's, but its Nikkorex 35, Nikkorex Zoom 35 and Nikon Auto 35 were all failures. The company finally saw the light and installed a focal-plane shutter in its Nikkorex F, which in turn eventually became the Nikkormat.

Of the early Japanese leaf-shutter SLRs, the most interesting innovator was the Topcon Wink Mirror, which also had a somewhat checkered history. The Wink Mirror (1960) was the first of its breed to incorporate an instant-return mirror. An exposure meter was added the next year, and the camera was renamed the Wink Mirror E. This was soon revamped as the Wink Mirror S and emerged in 1964 as the Topcon Uni, a designation that remained constant despite further refinements, until the inevitable switch to a focal-plane shutter resulted in the current Topcon IC-1.

These last three examples point up the challenge facing the collector of innovative Japanese cameras. The late '50's saw the beginning of frequent model changes, a practice that accelerated in the early '60's with rapid technological advances. The result was smaller production runs of a given model, making the cameras of this era more difficult to find than you would first think. But for those interested in historical hardware, the search will be well worth the effort in years to come. ☐

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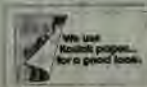
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GALLERY '79

□ The photographs on these pages were taken by photographers of professional caliber. If you feel your photographs are of similar quality, send us the evidence (along with a stamped, self-addressed return mailer—in case we don't agree). PhotoGraphic will consider either black-and-white or color photographs submitted according to the following guidelines:

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1. J.Y. Hernandez photographed this breathtaking Rocky Mountain vista along Colorado's Continental Divide. He used a Pentax MX with a 17mm fisheye lens and Kodak Kodachrome 25 Film; settings were 1/22 at 1/125.

2. This scene might have been photographed near almost any body of water in the world. The classic silhouetted fisherman was snapped at dawn in southern India by Jim Mamer, who used a Nikkormat EL and 105mm Nikkor lens to expose Kodak Ektachrome 200 Film.

3. Chris Ford photographed this bucolic scene in Lausanne, Switzerland last summer. The shot was taken late one afternoon after a storm. Ford used a Pentax Spotmatic camera, 50mm Takumar lens and Kodachrome 25 film.

4. Dean M. Leavitt often jogs past this rural wonderland, and one day he decided to capture the oasis of beauty on film. The Long Island scene was photographed with a Nikon FM and 50mm Nikkor lens on Kodak Kodachrome 64 Film.

5. When the Malibu-Agoura fire raged through part of Southern California last November, Bill Clark saw spectacular beauty in the natural disaster. He grabbed his Canon AE-1, with a Vivitar 35-85mm zoom lens and Kodachrome 25 film, and shot directly into the sun at dusk to make the picture.



GALLERY '79

1. Margaret McCarthy created this evocative dreamscape in the darkroom by combining two negatives that complement each other. The resulting image is majestic in its beauty and simplicity. Slumbering lady was lit with a tungsten lamp and photographed on Kodak Tri-X Film; exposure was made with a Nikon camera and 50mm Nikkor lens set for 1/60 at f/8. The puffy clouds were captured on Kodak Plus-X Film, with no exposure recorded. By dodging and burning-in during enlargement, the negatives were carefully composed on Agfa Portriga paper, which was developed in Ethol LPD.

2. Wild mustangs still roam the open country in the American West, and photographer Jerry Benterou found these near Haines, Oregon. The beautiful creatures were captured with a Canon FT camera, 50mm Canon lens and Ilford FP4 Film exposed for 1/250 at f/11.



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EASY FILM ID SYSTEM

Here's a simple method for easy film identification, especially useful when you are working with several kinds of film at once. Take film containers out of their cumbersome cardboard boxes and retain one of the paper end-flaps that has the film's name. Affix each flap to the outside of the appropriate film container using a piece of transparent tape stretched across the face of the flap and onto the plastic can. For a dozen rolls the procedure can be time-consuming, but it's worth it. In the end, each container will be precisely labeled, and as you take the film cassette from the container and load it into your camera, you can tape the flap-label onto the back of your camera (since the tape is still sticky after being adhered to plastic) or slip it into the camera's memo-holder, and you'll know exactly which film is inside your camera. Then once you've used up a roll, put the cassette into an unlabeled container and throw away the used flap. With a quick glance at your film supply you will immediately know that cans without labels contain exposed film.—PS

short EXPOSURES



WRITING ON RESIN

For several years I have been using resin-coated paper for all my printing. If you must have a permanent way to mark the resin-coated paper, a problem may arise when it comes to labeling these prints before processing. After trying several products, I discovered Sanford's Sharpie® felt-tip pen with black ink. Because the ink is permanent, waterproof and smearproof, marking on the back of the paper is permanent. However, it can be used for another purpose with just the opposite effect. When used on the front of the print before exposure, it can be wiped off in the wash water to leave a white image. This lends itself very nicely to auto-graphing your prints. Before exposing the paper, write your name, logo or whatever on the print. Make the exposure as usual, then process. When the print is in the wash, simply use light finger pressure and rub off the ink. Some other colors available are permanent and some are not. A print-finishing spray, however, will increase the life of the print and protect the nonpermanent inks. Colored pens work and look very nice on color prints. The two surfaces I have tried are Kodak F (glossy) and Kodak N (matte), and the Sharpie works



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well on both.—Jim Cook, Jr., Phoenix, Arizona



USE A FUNNEL TO WASH PRINTS

In a pinch, an ordinary funnel can be impressed into darkroom service to facilitate print washing. Set the funnel upside down over the drain in the sink and fill the basin with water. A paper clip at the tip of the funnel keeps prints from clogging the overflow. Some water will escape at the base of the funnel, but that works to good advantage since it allows more hypo (heavier than water) to be drained away.—KSG

PhotoGraphic Magazine will pay \$5 for each photo tip published. Text should be approximately 10-15 typewritten lines; photo illustration or line drawing only. Material will be returned only if a stamped, self-addressed envelope is included. Send your tips to "Short Exposures" Editor, Petersen's Photo-Graphic Magazine, 8490 Sunset Boulevard, Los Angeles, California 90069.

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☐ In the January, 1979 "One to One," I apparently missed the mark when I told Nick Kobernik of Glendale, Oregon, that he could use a can opener in a variety of ways to open his film cassettes. Since that column was published we have received a number of letters explaining that what Mr. Kobernik *really* wanted to know was how to get the film leader out of a cassette when it has rolled back in by accident. Since I rarely reuse a roll of film that has already been even partially exposed, I mistakenly assumed that an explanation of safe, in-the-dark cassette opening was in order. Oops!

I have received quite a few solutions for retrieving lost 35mm film leaders, but I think the best and easiest one comes from Herb Schumacher of Lancaster, Ohio. He sent in the device shown in the photograph, which is actually a piece of blank 35mm film cut to the shape of a film leader with a strip of two-sided Scotch tape attached. The retriever is inserted into the cassette with the tape side down until contact is made with the film. Herb says to move the spindle clockwise and counterclockwise several times, and after a few tries the tape will stick to the film, which can then be easily pulled from the cartridge. Herb carries one of these devices in his camera bag for just such emergencies.

After trying this handy device, I found it works very well, but you should follow a few steps to ensure things go smoothly. After inserting the retriever into the cartridge, loosen the contained film by rotating the cartridge spindle clockwise until you can't turn the spindle any more. This forces the film up against the inside top of the cassette and forces the film to stick to the retriever. Next, tighten the film/tape bond by rotating the spindle counterclockwise until the retriever begins to be wound into the cassette. Now the film is hooked, so to speak, and can be removed easily from the dark cassette by gentle pulling.

"Could you please explain what hyperfocal distance is and its relationship to depth of field?"—Bernie Arast, Richmond, Virginia.

The easiest way to explain hyperfocal distance is to describe how it is determined. The hyperfocal distance of a lens varies by aperture, but in general the hyperfocal distance of a lens can be determined by first focusing on infinity. Depth of field then extends back toward the lens from infinity to a point in between infinity and the lens. The distance from the camera to this nearest point of sharp focus is known as the lens' hyperfo-

ONE TO ONE

BILL HURTER

FOLLOW THE LEADER

cal distance.

The significance of the principle is that when a lens is focused on its hyperfocal distance, depth of field of the lens extends from half the hyperfocal distance out to infinity. By employing this principle, camera and lens manufacturers can make cheap fixed-focus lenses capable of rendering acceptably sharp images. By incorporating a wide field of view and a relatively small taking aperture (both are conditions that increase the



Shown here is a simple device used to recapture the film leader after it has been inadvertently rolled back into the cassette.

depth of field of a lens), a lens can be set at a fixed position (the hyperfocal distance of the taking aperture) to create unusually sharp pictures. With all of these things in operation a sharp photo can be made from a distance relatively close to the camera (usually seven or eight feet depending on the variables of focal length and aperture) all the way to infinity, thus eliminating the need for a lens-focusing mechanism, provided the pictures are taken with the main subject beyond the nearest distance of usable focus.

A quick way of finding the hyperfocal distance for a given lens at a given aperture is to first focus the lens on infinity. Examine the depth-of-field scale on the lens to determine where

the nearest point of usable focus falls. For example, for a 50mm lens focused on infinity, set at $f/8$, the near point of depth of field might be 30 feet. This is roughly the hyperfocal distance. To obtain the maximum band of sharpness of your lens, focus the lens on the hyperfocal distance—in our example, 30 feet. Depth of field now stretches from half the hyperfocal distance, 15 feet, all the way to infinity when the lens is at $f/8$.

Obviously, the smaller the aperture, the greater the range of usable focus. In our example, if the lens were set at $f/16$, the hyperfocal distance would be around 15 feet, and the band of usable focus would run from roughly eight feet to infinity. Knowing that the hyperfocal distance will change with the aperture, it is a simple matter to recheck the depth-of-field scale to find the hyperfocal distance when changing apertures.

This system, although somewhat imprecise, is good enough for situations in which you are either guess focusing or zone focusing—systems ideal for photographing sporting events or other action situations. This concept is also handy to know for obtaining the most sharpness in your scenes.

"When taking portraits with electronic flash, often the pupils of the subject's eyes appear red in the resulting print, while the other parts of the picture are totally satisfactory. Why does this happen, and how can I correct the problem?"—William A. Bryant, McKeesport, Pennsylvania.

What you are experiencing is known as "red-eye," and it is caused by the flash being too close to the lens axis. What actually happens is that light entering the eye strikes the retina at the back of the eye and is reflected back out again after illuminating the blood vessels in the retina; this is what tints the pupils red. Contrary to popular opinion, the subject does not have to be looking directly at the camera to get red-eye. The subject can be looking in any direction.

The effect seems to be worse in low-ambient-light situations when the pupil is wide open. The effect is minimized when the ambient-light level is raised, thus reducing the diameter of the pupil's opening.

The only real way to get rid of red-eye is to take the flash off the lens axis in any direction. If you are locked into using camera-mounted flash, either raise the room light or try to work in closer to your subject in order to increase the subject-lens/subject-flash angles and minimize the effect. ☐

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So it's no surprise that the newest breakthrough in SLRs comes from Pentax.

What is a surprise is that this new SLR is not a 35mm. It's the Pentax System 10. The world's first 110 SLR with interchangeable lenses, auto-winder, auto-flash, and completely-automatic programmed electronic exposure. In other words, it's the first entire SLR

system to ever appear in the compact, cartridge-loading, 110 format—complete with many of the features that are now just beginning to appear in the latest 35mm SLRs.

But that's not all. System 10 is by far the smallest and lightest SLR ever made. It measures just 2-1/5" x 3-9/10" x 1-4/5" with the standard lens. It weighs a mere 5.6 ounces. It will fit in the same area of your gadget bag where you would normally fit just one zoom lens. Or it will fit easily in your shirt pocket. And, as you'd expect, it's built with the same ruggedness and precision engineering that has made Pentax the world's largest seller of 35mm SLRs. Again, we expect to be imitated.

A NEW ERA IN 110 PHOTOGRAPHY

In the past, 110 negative images have been considered too small and grainy to be

enlarged with the kind of clarity demanded by today's photographers. But with the latest advances in 110 film resolution and Pentax lens technology, the way was cleared for a new kind of camera.

System 10 is that camera. The three, presently-available Pentax 110 lenses have been designed to optimize the potential of 110 films. System 10 lenses are so fine and so precise, that they can render a proper, razor-sharp image on the 110 negative itself. As you can see from the unretouched enlargement, our lenses are fully capable of producing color images of outstanding quality. Not just at 8"x10", but at 11"x14" also. In terms of image quality, System 10 is the first 110 camera that can honestly be favorably compared to a 35mm SLR.



PENTAX
SYSTEM 10



Unretouched enlargement from slide in lower left corner,
taken with Pentax Auto 110 camera with System 10 50mm Telephoto lens.

THE WORLD'S ONLY TOTAL-SYSTEM 110 SLR.

WITH INTERCHANGEABLE LENSES,
AUTO-WINDER, AUTO-FLASH AND PROGRAMMED AUTOMATIC EXPOSURE.



Camera shown 75% of actual size.

PROGRAMMED AUTO EXPOSURE

System 10's automatic exposure system is truly a wonder. Both aperture setting and shutter speed are programmed by the camera in accordance with the lighting conditions. By ingeniously combining the shutter with the aperture blades, Pentax engineers have created an exposure system that's amazingly sensitive and accurate, yet incredibly simple to use. System 10 even employs Silicon Photo Diodes, as opposed to the old, slow-responding CdS cells.

Shutter speeds vary from 1 sec. to 1/750 sec., while EVs range from 3 to 17 (ASA 400 with Pentax 110 24mm f/2.8 standard lens). Apertures range from f/2.8 to f/13.5.

110 SLR VIEWFINDER

As unbelievable as it may sound, the image in the viewfinder of the System 10 rivals that of even the best 35mm SLRs, in terms of size, brightness, clarity and contrast.

Inside, you'll find a surprisingly large, split-image finder, surrounded by a matte glass field. You'll also see either a green or a yellow LED in the lower right corner. The green LED lights up when there's enough light for shooting at shutter speeds faster than 1/30 sec. If an exposure below that speed is required, the yellow LED lights up, meaning a tripod or flash is suggested to shoot your picture.

The split-image finder, the LEDs, and your subject are all you'll see in the viewfinder. No needles. No clutter. All you need is focus and shoot.

SUPERB LENSES

System 10 comes with a standard Pentax 24mm f/2.8 lens. It has 6 elements in 5

groups, and it's the equivalent of a normal 50mm lens in the 35mm format. Also available are a wide-angle 18mm f/2.8 lens, perfect for scenics or interiors, with 6 elements in 6 groups (35mm equivalent: 35mm), and a moderate telephoto 50mm f/2.8 lens, perfect for portraits and candid shots, with 5 elements in 5 groups (35mm equivalent: 100mm).

All lenses are bayonet-mount, so changing them is literally a snap.

A variety of close-up lens attachments are also



18mm wide-angle lens.



24mm standard lens.



50mm telephoto lens.

available, so you can take terrific macro shots of stamps, coins, or anything small.

WINDER 110

The Pentax Micro Power Winder can fire off exposures at 1 fps. It's compact, light, very quiet. It even automatically advances your film to the



first frame. It's powered by two penlight AA batteries, which deliver over 1,200 exposures. And after the last exposure on the cartridge, no rewinding is necessary. Just pop out the cartridge and get it processed.



Catch the action with the Micro Power Winder.

PROGRAMMED FLASH

The Auto Flash AF 130 P threads and locks into a socket on top of the System 10. It's a "dedicated" flash which automatically



synchronizes the shutter speed and aperture of the camera. It provides over 250 auto exposures (from 2.6' to 15'), all with just two 1.5V AA Alkaline batteries.

ACCESSORIES

Individual UV and skylight filters may be obtained for both standard and wide-angle lenses. Collapsible lens hoods, camera pouch, and eyepiece correction lenses as well as close up lenses are also available.

The System 10 combines the sophistication and versatility of a modern 35mm SLR with the compact ease of the 110 film format.



To the professional and the advanced amateur it's an excellent second camera that fits anywhere, and could even become your camera of choice.

To the world of photography, it's a major breakthrough. But then, that's no surprise. After all, it's made by Pentax.

Pentax System 10. (Available in limited quantities only, at select photographic stores.) For more information write: Pentax System 10, P.O. Box 2585, Littleton, Colorado 80161.

PENTAX® SYSTEM 10

When you think about essentials that make a photo great, think about processing, too.

We do. And we take the responsibility seriously. All film we process gets the benefits of highly sophisticated technology. And the attention of people skilled in the requirements of more than 24 different Kodak films.

Kodak offers many different

Kodachrome
SLIDE



PROCESSED BY KODAK

ways to get more from your photos: enlargements, duplicates, prints from movie frames. And copy-prints and enlargements from instant prints.

You can also enjoy the conveniences of prepaid processing mailers. Ask for Kodak mailers.

Kodak color processing.
It completes the picture.



Photo by Paul Rundell.
Processing by Kodak.

